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New taxa and new records of Winnertziinae and Porricondylinae (Diptera: Cecidomyiidae) from Germany

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Abstract. Winnertziinae and Porricondylinae are two subfamilies of mycophagous Cecidomyiidae (gall midges). An earlier census in 2021 found the German fauna of both groups to comprise 53 species and 28 genera – only a small proportion of the nearly 400 species and 75 genera known from all of Europe. A 24-month inventory in 2021–2023, whose most significant taxonomic and faunistic outcomes are presented here, yielded evidence of an additional 142 species and 24 genera present in Germany, more precisely 41 species and three genera of Winnertziinae, and 101 species and 21 genera of Porricondylinae. Included in these numbers are 30 new species (six Winnertziinae, 24 Porricondylinae) and one new genus (of Porricondylinae) described and named here. The number of potentially new species discovered during the project is considerably larger (85+), but the too poor condition of the specimens and various other circumstances do not permit their taxonomic description at this stage. New taxa named in the present paper are *Johnsonomyia szadziewskii* sp. nov., *Rhipidoxylomyia bilobata* sp. nov., *Winnertzia haushoferorum* sp. nov., *Winnertzia incrassata* sp. nov., *Winnertzia macrodens* sp. nov., *Winnertzia subdentata* sp. nov., all Winnertziinae, *Asynapta doczkali* sp. nov., *Asynapta falcata* sp. nov., *Bryocrypta longissima* sp. nov., *Camptomyia serrata* sp. nov., *Cassidoides rainensis* sp. nov., *Cassidoides riparius* sp. nov., *Claspettomyia gracilostylus* sp. nov., *Claspettomyia parvidentata* sp. nov., *Divellepidosis bavarica* sp. nov., *Lamellepidosis luderbuschensis* sp. nov., *Neurepidosis hartschimmelhofensis* sp. nov., *Neurepidosis simplex* sp. nov., *Parepidosis lobata* sp. nov., *Porricondyla acutistylata* sp. nov., *Porricondyla insolita* sp. nov., *Porricondyla oblonga* sp. nov., *Porricondyla ornata* sp. nov., *Porricondyla pilosoides* sp. nov., *Porricondyla plana* sp. nov., *Porricondyla pumila* sp. nov., *Schistoneurus paraimpressus* sp. nov., *Schistoneurus subimpressus* sp. nov., *Spungisomyia germanica* sp. nov., *Wohllebenia* gen. nov., and *Wohllebenia hybrida* gen. et sp. nov., all Porricondylinae. Taxonomic descriptions are based on both the morphology of males and, if available, CO1 (DNA barcode) sequences, using specimens collected by Malaise traps in Bavaria and Baden-Württemberg, the two southernmost federal states of Germany. Released here are 150 BINs new to BOLD as well as 145 species names for previously unidentified BINs in BOLD. Redescriptions of male morphology are provided for *Camptomyia heterobia* Mamaev, 1961, *Claspettomyia carpatica* Mamaev, 1998, *Dicerura scirpicola* Kieffer, 1898, and *Winnertzia betulicola* Mamaev, 1963. The state of knowledge of Germany's fauna of mycophagous gall midges is discussed.

Key words. Gall midges, mycophages, new genus, new species, DNA barcodes.

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Introduction

Where to find and how to study mycophagous cecidomyiids

The family of gall midges, Cecidomyiidae Newman, 1843, primarily includes phytophages (including gall-inducers), mycophages and predators. Mycophagy, the ancient mode of feeding, is extant in all six subfamilies recognized today, whereas phytophagy and predation are confined to the Cecidomyiinae, the largest and most advanced subfamily (Gagné & Jaschhof 2021). Catotrichinae Edwards, 1938, Lestremiinae Rondani, 1840, Micromyinae Rondani, 1856, Winnertziinae Panelius, 1965, and Porricondylinae Kieffer, 1913 are commonly considered as universally mycophagous, although the larval stage and particulars of the larval diet are unknown for most of them. The taxonomy of mycophagous cecidomyiids is largely built on the morphology of adults, mainly because larvae and pupae are much harder to obtain for study. An experienced eye can detect the larvae by visual search in all kinds of decomposing plant litter, such as deadwood, and in the topsoil of both grass- and woodlands, where they consume the contents of fungal hyphae. Adults are readily and superabundantly available for taxonomy from entomological trap catches. The Malaise trapping method, routinely used for collecting mycophagous cecidomyiids since the late 1990s, was decisive in revealing the true scale of the group's taxonomic diversity. Inevitably, ease of collection comes at the cost of meager biological information for specimens caught in flight. As regards the identification, classification and description of species, the morphology of males has, beginning in the late 1930s, gradually become the focus of attention. Less than a decade ago, the DNA barcoding technique was adopted to assist morphology in identifying and resolving complex species. Known as integrative taxonomy, this practice is now in full play. Methodological issues, including historical contexts, were explicitly addressed in various papers published in the recent past (Jaschhof & Jaschhof 2009, 2013, 2020b, 2021a, 2021b).

Studying the hyperdiversity of cecidomyiids: the contribution by GBOL III: Dark Taxa

For a long time, specialist taxonomists of Cecidomyiidae have been aware of the enormous size of 'their' family, as well as the tremendous mismatch between described and undescribed species (Gagné 1994; Harris 1994). While science is still seeking a numerical estimate of cecidomyiid diversity remaining to be recognized and described (not to speak of studied in detail), DNA barcoding data suggest that Cecidomyiidae are at the top of the list of the most species-rich families of flying insects; and not only in the tropics as supposed earlier, but regardless of continent, climatic region and habitat type (Srivathsan *et al.* 2023). Data currently available are insufficient to estimate how this hyperdiversity manifests itself at the levels of subfamilies or trophic groups. In terms of species named in the past across the world, the subfamily Cecidomyiinae, with about 5000 species, outnumbers the mycophagous subfamilies with their combined 1500 species by a factor 3.3 (Gagné & Jaschhof 2021). Conceivably, this difference reflects the long-term allocation of research interests rather than a numerical superiority of phytophages. Summarizing their experiences from 15 years of cecidomyiid research in Sweden, Jaschhof & Jaschhof (2021a) estimated the size ratio of the phytophagous, predatory and mycophagous guilds in this part of northern Europe at 3:1:5.

Since the hyperdiversity of Cecidomyiidae comes along with long-term neglect by taxonomists (Srivathsan *et al.* 2023), the family was chosen as one of 12 groups targeted by GBOL III: Dark Taxa, the most recent project in the German Barcode of Life initiative. Launched in mid-2020, the two main goals of this multi-faceted project are "(1) to study various DT [= dark taxa] families using an integrative taxonomic approach which combines morphological and sequence data, and (2) to expand the DNA barcode reference library established by three earlier initiatives (Barcoding Fauna Bavarica, GBOL I, GBOL II)" (Chimeno *et al.* 2022). For reasons of feasibility, the Cecidomyiinae (see Skuhravá *et al.* (2014) for a review of this subfamily in Germany) were from the beginning excluded from coverage, so that all attention could be directed to the mycophagous subfamilies (with Catotrichinae being unknown to occur in Europe). The present paper describes the outcome of GBOL III: Dark Taxa regarding the

taxonomy and faunistics of Winnertziinae and Porricondylinae. The focus was given to these two subfamilies because previous research had a bias towards Lestremiinae and Micromyinae (Jaschhof & Jaschhof 2021b).

Earlier knowledge of the focal taxa in Europe and Germany

Winnertziinae and Porricondylinae combined have about 800 described species in the world, of which about 400 are known from Europe (Gagné & Jaschhof 2021). It would be wrong to conclude from those numbers that Europe is well-investigated for these flies. Previous surveys of Winnertziinae and Porricondylinae considered merely one quarter of Europe's land area, basically a crescent-shaped belt extending from the British Isles in the west, via Scandinavia at the center, to the Moscow area in the east. The territory of Sweden, with records of 305 named species, may be regarded as the best-surveyed part of Europe, although the taxonomic inventory conducted there for 15 years is not yet fully accomplished (Jaschhof & Jaschhof 2013, 2021a). Prior to GBOL III: Dark Taxa, Germany belonged to the remaining three quarters of the continent whose Winnertziinae and Porricondylinae have never been methodically mapped. Although 19th century entomologists, such as Friedrich Hermann Loew, Ewald Heinrich Rübsaamen and Johannes Winnertz, described several new species from Germany, their discoveries must be regarded as random rather than resulting from methodical survey. A similar situation persisted through most of the 20th century. It so happened that Meyer's primarily ecological study of gall midges in salt marshes of northwestern Germany could rise to the position of the major source of faunistic data on German Winnertziinae and Porricondylinae (Meyer 1984). In a recent revision of Meyer's specimens, as well as unpublished material from elsewhere and species citations in the literature, Jaschhof & Jaschhof (2021b) recognized a total of 53 species whose presence in Germany is evidenced by vouchers in collections. The only other modern publication dealing with the Winnertziinae and Porricondylinae of Central Europe is that by Sikora *et al.* (2017) on the fauna of the Czech and Slovak Republics.

The 142 species dealt with here are either new to science or new records for Germany (and often also for Central Europe). While the main purpose of the present paper is to communicate hard data, I take the opportunity to discuss the status quo of the taxonomic inventory of Germany's mycophagous cecidomyiids upon completion of GBOLIII: Dark Taxa.

Material and methods

Material

Specimens, mostly males, were extracted from Malaise trap samples in custody of the SNSB-Zoologische Staatssammlung München, Munich, Germany (in the following referred to by the acronym ZSM). A total of 191 insect samples, partly unsorted (but sieved to retain only specimens the size of about 10 mm, or smaller), partly presorted to family, were screened for winnertziines and porricondylines deemed suitable for taxonomy. The material, collected exclusively in the federal states of Bavaria and Baden-Württemberg, covered a broad range of habitats known to be frequented by the target groups, including old-growth broadleaf forest and extensively grazed, botanically rich grassland. Specimens selected for closer study underwent a two-step preparation process: first, three legs were harvested for DNA extraction; then, the rest of the body was dissected and mounted on a microscope slide in Canada balsam for morphological study (Jaschhof & Jaschhof 2009). The micropreparations, including type specimens, will be deposited as reference material in the ZSM collection. All specimens referred to in the present paper are traceable in the collection by individual identifiers (such as ZSM-DIP-42306-G11).

Morphological study

Morphological structures were studied using transmitted light microscopy (up to 400× magnification). Morphological terms applied here are in accordance with the monograph by Jaschhof & Jaschhof

(2013). Body lengths, taken from slide-mounted specimens, include the terminalia. Both the cerci and hypoproct are usually not described and illustrated; these structures might have taxonomic merit, but in slide mounts tend to distort and be overlayed by other structures, which renders them difficult to assess. In both the taxonomic descriptions and illustrations, numbered arrows (↓[1]) are used to highlight major diagnostic characters. The descriptive sections, headed "other characters", mention only those characters that are not referred to in the diagnoses. Within a subfamily, subordinated categories (tribe, genus, species) are treated in alphabetical order.

DNA sequencing and data analysis

Tissue (three-leg) samples were sent to the Canadian Centre for DNA barcoding in Guelph, Canada, for DNA extraction and barcode sequencing following standardized high-throughput protocols (Ivanova *et al.* 2006; deWaard *et al.* 2008; Hebert *et al.* 2018). All specimens whose DNA barcode sequence was successfully identified are referred to in Supp. file 1. Specimen data are accessible in the Barcode of Life Data Systems (BOLD) as a single citable dataset (https://doi.org/10.5883/DS-GBCECI1). Sequence data can be obtained also through BOLD via the process IDs given here for each specimen (e.g., BOLD GBDTA10386-21). A neighbor-joining tree of CO1 barcode sequences was calculated using the Kimura two parameter model of sequence evolution ("K2P distances", see Kimura 1980; Supp. file 1). Barcode Index Numbers (BINs), commonly regarded as closely corresponding to biological species, were assigned by the BOLD system (Ratnasingham & Hebert 2013). In the present study, BINs were used to delineate molecular operational taxonomic units (MOTUs), which were then subjected to morphotaxonomic scrutiny. BOLD's BIN Database (https://www.boldsystems.org/index.php/Public_BarcodeIndexNumber_Home) was consulted to determine whether BINs obtained here were new to, or already existent in BOLD, and in the latter case, their provenance. No effort was made, however, to verify the identification of preexisting BINs by morphological reexamination of physical voucher specimens.

Integrative taxonomy

Although the present study was based on an integrative approach, morphologal criteria were rated as critical for the decision whether two (or more) specimens should be assigned to the same species. Thus, MOTUs obtained by DNA barcoding were regarded as conspecific as long as morphological scrutiny failed to detect distinctions traditionally used for delimiting species. As a result, a specific name may be associated with more than one (maximum three) BIN(s) and in the future might be revealed to denote a complex of sibling species (alternatively, several BINs may collapse into one with more and more individual sequences added). Unresolved cases, where it is already clear that more than one species occur under a particular species name, are highlighted by 'agg.' for aggregate. Aggregate species can usually be disentangled once additional material has become available for comparative study.

Presentation

Full lists of bibliographical references and synonymies for described taxa can be found in the revision of Winnertziinae and Porricondylinae by Jaschhof & Jaschhof (2013) and the world catalog of Cecidomyiidae by Gagné & Jaschhof (2021); thus, they are not replicated here.

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Diptera Linnaeus, 1804
Suborder Bibionomorpha Hennig, 1954
Family Cecidomyiidae Newman, 1834

Subfamily **Winnertziinae** Panelius, 1965

This medium-size subfamily of 230 described species, not counting fossils, was established by Jaschhof & Jaschhof (2013) for three tribes formerly accomodated in the traditional Porricondylinae, or Porricondylinae sensu lato: Heteropezini Schiner, 1868, Diallactiini Jaschhof, 2009, and Winnertziini Panelius, 1965. More than half of the species belong to the genus *Winnertzia* Rondani, 1860; the rest are distributed across 30 different genera, of which only two have more than ten species (Gagné & Jaschhof 2021). The European fauna previously comprised 16 genera and 110 species, the German fauna seven genera and 13 species (Jaschhof & Jaschhof 2021b). New additions to the German fauna documented here amount to three genera and 42 species, six of which new to science.

Tribe **Diallactiini** Jaschhof, 2013

The maximum diversity of Diallactiini is found in the tropics (Jaschhof 2016b). Of four genera known from Europe, two occur in Germany: *Gynapteromyia* Mamaev, 1965 (Jaschhof & Jaschhof 2021b) and, as shown here, *Johnsonomyia* Felt, 1908.

Genus ***Gynapteromyia*** Mamaev, 1965

This genus of almost global distribution is absent in the Afrotropics (Jaschhof 2016b). Of five species occurring in Europe (Jaschhof & Jaschhof 2013, as *Chastomera brevipalpis* group), two were previously known from Germany (Jaschhof & Jaschhof 2021b) and one is reported here as a new to the German fauna.

Gynapteromyia brevipalpis (Mamaev, 1964)

Morphological identification

Jaschhof (2016b).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Bavaria, Rain; 48°64′61″ N, 11°01′89″ E; elev. 429 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-G11 • 1 ♂; same data as for preceding; ZSM-DIP-42306-G12.

Distribution

Germany (new record); Estonia, Latvia, European part of Russia (Gagné & Jaschhof 2021).

Genus ***Johnsonomyia*** Felt, 1908

This genus previously had nine species, three Nearctic, one Palearctic, one Neotropical, two Afrotropical, and two Oriental (Jaschhof 2016b). The Palearctic *J. palpata* Mamaev, 1966, was until now the only species known from Europe (Spungis 1985). A new *Johnsonomyia* close to *J. palpata* is described here from Bavaria, representing the westernmost occurrence of this genus in Europe and the Palearctic region.

Johnsonomyia szadziewskii sp. nov.
urn:lsid:zoobank.org:act:04D870AA-91F7-4BB1-90C0-DB0A1DEC05F3
Fig. 1

Diagnosis

Morphology

Males of *J. szadziewskii* sp. nov. differ from those of congeneric species by several morphological characters in combination, as follows. The palpus is of ordinary size, i.e., not unusually thick (Fig. 1A); Rs is darkly tinted and thus markedly darker than other veins; the subtrapezoid ninth tergite has a nearly straight, unmodified posterior margin (↓[1], Fig. 1C); and the gonostylus, which is slightly flattened and markedly thicker basally than apically, has a slight swelling with microtrichia subapically below the apical tooth (↓[2], Fig. 1D). Females and preimaginal stages of *J. szadziewskii* are unknown.

DNA barcode

CO1 sequences (640–658bp) of two of the three specimens detailed below were allocated to two BINs, BOLD:AEO8882 (holotype) and BOLD:AEM8765 (paratype ZSM-HYM-25591). Reexamination of the respective specimens failed to find morphological distinctions in support of the genetic clustering (distance 6.73%). A search in BOLD's BIN Database retrieved no further results for these BINs (accessed 25 Aug. 2023). CO1 sequences of *J. palpata* are unknown, and thus unavailable for comparison with *J. szadziewskii* sp. nov.

Etymology

This species is named in honor of Ryszard Szadziewski, professor emeritus of the University of Gdansk, Poland, and specialist taxonomist of Ceratopogonidae and other nematoceran Diptera.

Type material

Holotype

GERMANY • ♂; Bavaria, Lower Franconia, Rauhenebrach; 49°91′82″ N, 10°56′03″ E; elev. 366 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10278-21; ZSM-DIP-42307-B06.

Paratypes

GERMANY • 1 ♂; Bavaria, Germaringen; 47°96′30″ N, 10°67′62″ E; elev. 650 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42307-B05 • 1 ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow; BOLD GBCEC001-21; ZSM-HYM-25591.

Other characters

Male

Body length. 3.5 mm.

Head. Genal setae 15–17, not clustered. Eye bridge dorsally 6–7 ommatidia long. Scape concolorous with flagellum, with 1–2 setae; pedicel slightly brighter, glabrous. Fourth flagellomere (Fig. 1B) with neck 1.1× as long as node; node with whorl of subbasal setae intermingled with short hair-like translucent sensilla, a dense crenulate whorl of sensory hairs medially, microtrichia only basally (not illustrated). Palpus longer than head height, with 4 setose segments, first to third segments with sparse short hair-shaped translucent sensilla, first and second segments slightly thicker than third and fourth, fourth segment longest of all (Fig. 1A).

Wing. Shorter than body. Length about 3.0 mm. Length / width ratio 2.9.

Legs. Tarsomeres 2–5 brighter than other segments. Claws slightly bent, untoothed. Empodia vestigial.

Terminalia (Fig. 1D). Gonocoxal synsclerite broader than long; ventral emargination deeply U-shaped, basally occupied by thin membrane devoid of vestiture; ventral bridge glabrous, its central portion darkly pigmented (presumably indicating presence of ninth sternite); medial bridges with conspicuously dense cover of short setae; posterior portions of dorsal apodemes strongly sclerotized and pigmented, anterior portions thick, with indistinct contours terminally, slightly longer than distance separating them. Gonostylus in ventral view 2.2 × as long as broad, with pointed apical tooth of moderate size. Tegmen roughly triangular; parameral apodemes strongly, remaining portions moderately sclerotized; apical portion slightly constricted, its surface uneven due to covering with tiny scales or knobs. Aedeagal apodeme thick, longer than tegmen, its apical and basal portions weakly contoured, with indistinct membranous, apparently funnel-shaped broadening apically. Both cerci and hypoproct densely microtrichose, cerci glabrous or with single seta posteriorly, hypoproct glabrous (Fig. 1C, microtrichia not illustrated).

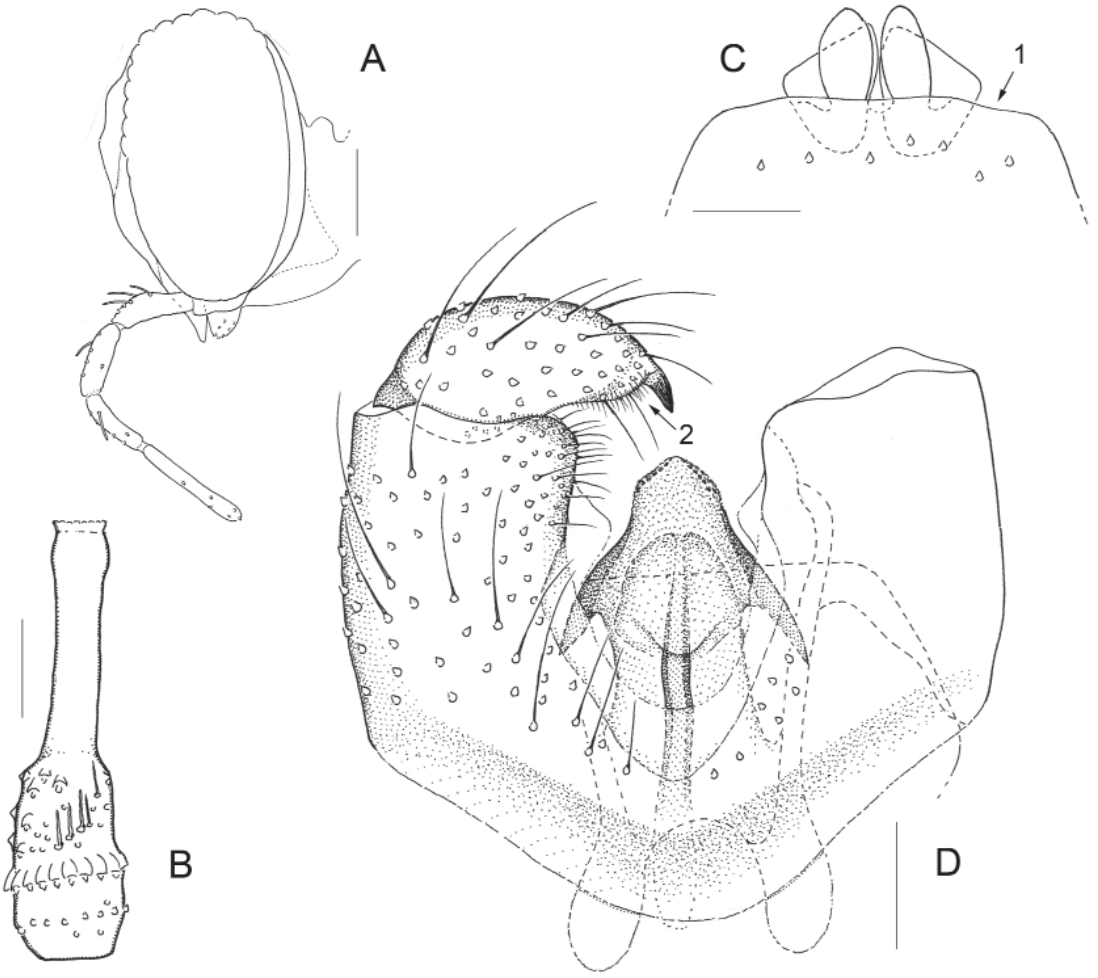

Fig. 1. *Johnsonomyia szadziewskii* sp. nov., ♂♂. **A**. Head, lateral view, holotype (ZSM-DIP-42307-B06). **B**. Fourth flagellomere, lateral view, holotype. **C**. Ninth tergite, hypoproct and cerci, dorsal view, paratype (ZSM-HYM-25591). **D**. Terminalia, ventral view, holotype. Scale lines: A = 0.50 mm; B–D = 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Differential diagnosis

In *J. palpata*, the only other European species of the genus, all four palpal segments were described as very robust and equally thick (Mamaev 1966: fig. II.4), which clearly differs from the condition found in *J. szadziewskii* sp. nov. As a further distinction, the gonostylus of *J. palpata* was illustrated as evenly, strongly tapered towards the apex (Mamaev 1966: fig. II.5; Spungis 1985: fig. 4.1). Mamaev (1968: fig. 4.2) described the ninth tergite of *J. palpata* as possessing a pair of microtrichose lobes at the posterior margin, while the ninth tergite of the new species is unmodified. In my opinion, it is more likely that those lobes constitute the distal portions of the cerci rather than a part of the ninth tergite (see the situation in *J. szadziewskii*, Fig. 1C), which would render this putative difference irrelevant. Nearctic *Johnsonomyia*, especially *J. fusca* Felt, 1908 and *J. rubra* Felt, 1908 (type species), are generally similar to *J. szadziewskii*, although their terminalia differ in several details (Jaschhof 2016b). Two species from the Russian Far East described as *Johnsonomyia* and later associated with *Haplusia*, *H. pallida* (Mamaev, 1966) and *H. obscuripes* (Mamaev, 1968), differ from the species discussed above in that certain leg segments are decorated by apical clusters of dense, dark setae (Mamaev 1966: fig. II.7).

Distribution

Ryszard Szadziewski (in litt., 6 Aug. 2021) provided me with sketches of the head and the terminalia of the male supposed to represent the only Polish record published of *J. palpata* (Szadziewski 1976). As is now obvious, the specimen was misidentified and actually belongs to the new species described here. Accordingly, *J. szadziewskii* sp. nov. is known from both Germany and Poland, and the only European occurrence of *J. palpata* is Latvia (Spungis 1985). Since the westernmost distributions known of *J. palpata*, Kauguri and Dārzini in Latvia (Spungis 1985), are only 450 km away from Toruń in Poland, the easternmost distribution known of *J. szadziewskii*, it is possible that the ranges of both species overlap.

Tribe **Winnertziini** Panelius, 1965

Winnertziini is the most species-rich tribe of the subfamily Winnertziinae, mainly due to genus *Winnertzia* Rondani, 1860 with more than 130 extant species globally (Gagné & Jaschhof 2021). The second-largest genus is *Rhipidoxylomyia* Mamaev, 1964, previously with 17 extant species named globally; the remaining four genera contain fewer than five species each (Gagné & Jaschhof 2021; Plakidas 2022). All genera described in this tribe, with the exception of *Bernadottea* Jaschhof & Jaschhof, 2018, occur in Europe. Prior to the present project, the Winnertziini of Germany were poorly known, the only records being six species of *Winnertzia* (Jaschhof & Jaschhof 2021b). First-time records presented here amount to two genera and 40 species, including five species new to science.

Genus ***Ekmanomyia*** Jaschhof, 2013

This monotypic genus, previously recorded from Sweden and the Czech Republic (Gagné & Jaschhof 2021), is shown here for the first time to occur in Germany.

Ekmanomyia svecica Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (640–652bp) of the three specimens listed below are available in BIN BOLD:AEP5728. A search on BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Munich, Allacher Lohe Nature Reserve; 48°19′88″ N, 11°47′54″ E; elev. 502 m; 23 Jun.–5 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; heathland; BOLD GBDTA10313-21; ZSM-DIP-42307-E05 • 1 ♂; Hauptsmoor E of Bamberg; 49°91′64″ N, 10°93′75″ E; elev. 281 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10546-21; ZSM-DIP-42310-A01 • 1 ♂; Upper Bavaria, Ebersberg, Ebersberger Forst; 48°10′69″ N, 11°95′30″ E; elev. 569 m; 11 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10570-21; ZSM-DIP-42310-C01.

Distribution

Germany (new record); Sweden, Czech Republic (Gagné & Jaschhof 2021).

Genus ***Rhipidoxylomyia*** Mamaev, 1964

The genus *Rhipidoxylomyia*, with 18 extant species in the Nearctic, Palearctic and Oriental regions, has seven species in Europe, including a new species described here from Bavaria (Gagné & Jaschhof 2021; Plakidas 2022). Jaschhof & Jaschhof (2013), who reviewed *Rhipidoxylomyia* as then known from Europe, pointed to the difficulties in interpreting descriptions of extra-European species published in the literature. The genus is a new record for Germany (Jaschhof & Jaschhof 2021b).

Rhipidoxylomyia bilobata sp. nov.

urn:lsid:zoobank.org:act:4A6111F6-495E-4025-92D3-A9EE9D2DCBC6

Fig. 2

Diagnosis

A typical representative of the genus, this species belongs to a subset in which T_1 bears a slender microtrichose process (in distinction from a true spine, characterized by a pointed apex and absence of microtrichia). *Rhipidoxylomyia bilobata* sp. nov. is distinguished by the male ninth tergite, whose emargination extends halfway down the tergite's total length (↓[1], Fig. 2A), and thus is deeper than in any other species of the genus. The tegmen has the shape of an equilateral triangle (↓[2], Fig. 2A), which, on condition that this outline is stable, is a further peculiarity of this species. *Rhipidoxylomyia bilobata* is known from a single male; larvae and females are unknown.

Etymology

The Latin adjective '*bilobata*' means 'bilobate', describing the structure of the male ninth tergite.

Type material

Holotype

GERMANY • ♂; Bavaria, Lower Franconia, Bobingen; 48°27′18″ N, 10°84′03″ E; elev. 524 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42310-E05.

Other characters

Male

Body length. 1.9 mm.

Head. Eye bridge dorsally 3–4 ommatidia long. Antenna markedly shorter than body; scape and pedicel slightly darker than flagellum; 11 flagellomeres, necks somewhat brighter than nodes; translucent sensilla on flagellomeres 1–9, two per flagellomere, either simple, bi- or trifurcate. Neck of fourth flagellomere 0.8 × length of node, node slender, twice as long as broad (Fig. 2B). Palpus shorter than head height, 4-segmented, fourth segment as long as second and third segments combined.

Thorax. Pronotal setae 7. Mediotergal lateral microtrichia of normal size. Parascutellar area bright, clearly contoured by dark margin.

Wing. Markedly shorter than body. Length / width ratio 2.3. Costal cell reinforced. M_4 weak, nearly straight, CuA gently bent, both veins declining before wing margin.

Legs. Scales pointed. Fore tibia 1.1 × length of T_2. Acropods: claws slightly bent, basal tooth large. Empodia ⅓ of claw length.

Abdomen. Pleural membrane devoid of setae.

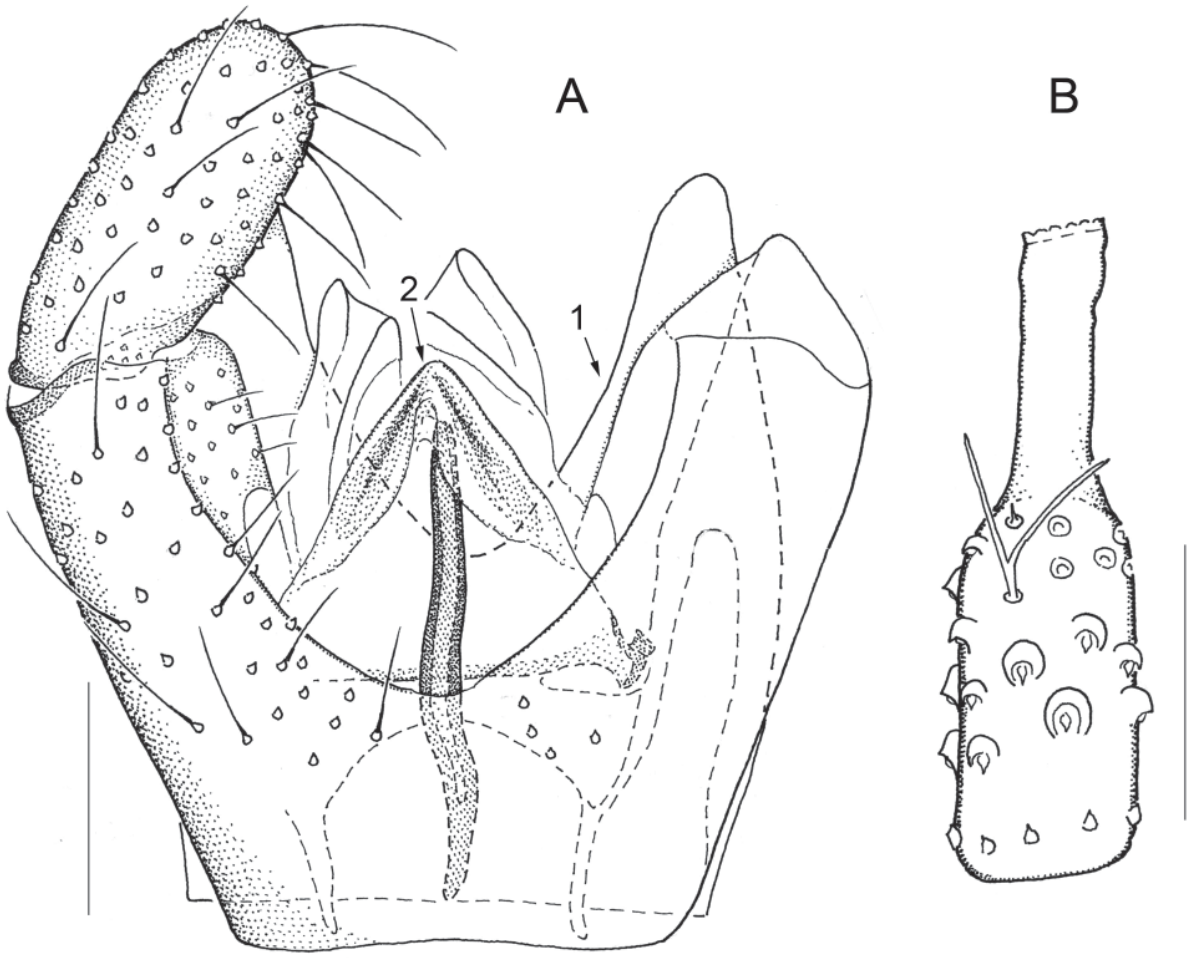

Fig. 2. *Rhipidoxylomyia bilobata* sp. nov., holotype, ♂ (ZSM-DIP-42310-E05). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Terminalia (Fig. 2A). Ninth tergite as long as gonocoxae, setae confined to posterior and lateral portions, anterior margin straight, indistinct. Gonocoxal synsclerite broader than long; ventral emargination very deep, U-shaped; a considerable portion ventrobasally glabrous; dorsoposterior portions protruding beyond ventroposterior portions; dorsal apodemes thin, slightly shorter than distance separating them. Gonostylus massive, subcylindrical, 2.3 × as long as broad, broadly rounded apically. Tegminal flaps distinct, broad, slightly sclerotized; parameral apodemes small. Aedeagal apodeme gently narrowing beyond midlength, apex more strongly narrowed for a short distance. Aedeagal bulge with loose, irregular lines of tiny spikes.

Rhipidoxylomyia perfecta Mamaev, 1998

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (640bp) of the specimen detailed below is available in BIN BOLD:AEO6913. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10383-21; ZSM-DIP-42308-C04.

Distribution

Germany (new record); Sweden, European part of Russia (Gagné & Jaschhof 2021).

Genus ***Winnertzia*** Rondani, 1860

With more than 130 species named globally, *Winnertzia* ranks among the three largest genera of mycophagous cecidomyiids (Gagné & Jaschhof 2021). It was recently shown regarding *Winnertzia* in Sweden that a large proportion of the intrageneric diversity remains to be discovered and described, even in regions where the genus has been studied before (Jaschhof & Jaschhof 2020b). As a consequence, *Winnertzia* was estimated to have 300–400 species in Europe, i.e., four to five times as many as have been named from this continent in the past (Jaschhof & Jaschhof 2020b). The results obtained here confirm this estimate. While prior to the present project only six species had been documented in the literature (including *W. globifera* Mamaev, 1963 agg.), there is now evidence of more than 109 different *Winnertzia* occurring in Germany, of which 43 can be named (incl. *W. bulbifera* Mamaev, 1963 agg., *W. discretella* Spungis, 1992 agg., *W. solidaginis* Felt, 1907 agg., *W. xylostei* Mamaev, 1963 agg., and four new species). The 66 species left unnamed here are either new to science (presumably constituting the majority) or cannot be recognized by means of descriptions available from the literature. Jaschhof & Jaschhof (2020b) discussed in detail the enormous challenges that taxonomists face when attempting to subject *Winnertzia* in Europe to a comprehensive revision. With such a revision pending, several of the species treatments below should be understood as describing merely the present state of research rather than ultimate knowledge.

Winnertzia acutistylus Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (652bp) of the three specimens detailed below are available in BIN BOLD:AER2277. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10371-21; ZSM-DIP-42308-B04 • 1 ♂; same data as for preceding; BOLD GBDTA10400-21; ZSM-DIP-42308-D09 • 1 ♂; same data as for preceding; BOLD GBDTA10427-21; ZSM-DIP-42308-F12.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia angustistylus Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (640–652bp) of the three specimens detailed below are available in BIN BOLD:AEI2068. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′17″ N, 8°33′20″ E; elev. 114 m; 3–10 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of aspen trees; BOLD DTIII8421-22; ZSM-DIP-42473-F01. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′88″ N, 11°18′44″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA10429-21; ZSM-DIP-42308-G02 • 1 ♂; same data as for preceding; BOLD GBDTA10434-21; ZSM-DIP-42308-G07.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia betulicola Mamaev, 1963
Fig. 3

I identify here several large, unusually colorful males of a *Winnertzia* hitherto unknown to me as *W. betulicola*. This species was described by Mamaev (1963) from a single specimen, the holotype male, whose terminalia were figured both in the original description (Mamaev 1963: fig. 2.9) and in Spungis's revision of European Winnertziini (Spungis 1992: fig. 47). The terminalia of my specimens from Germany (Fig. 3) match those illustrations fairly well; the mismatches I noticed, such as regarding the outline of the ninth tergite, the gonostylus and the tegmen, I attribute to the fact that the holotype

specimen is obviously somewhat compressed by the cover slip. Although Mamaev (1963) and Spungis (1992) were of the opinion that the morphology of *W. betulicola* is unmistakable, I provide here a reworked specific diagnosis including a terminalia illustration, since certain characters that I deem diagnostic went unnoticed in the past.

Revised diagnosis

Morphology

Males studied here are up to 2.5 mm long; Mamaev (1963) described for the holotype specimen 3.5 mm. The basic coloration of the body is a light brown with orange tinge, which contrasts with the flagellomeres with dark-brown nodes and whitish necks, and the mostly yellowish legs with dark-brown femoral apices and tarsi. The legs' bicoloration is mainly caused by setae and scales that form a dense, adpressed cover. A dense cover of almost black, erect setae and scales on various parts of the head (clypeus, gena) and thorax (scutum, scutellum) as well as the entire abdomen contributes to the body's colorful impression, which to appreciate requires undisturbed specimens. Also, the terminalia are two-

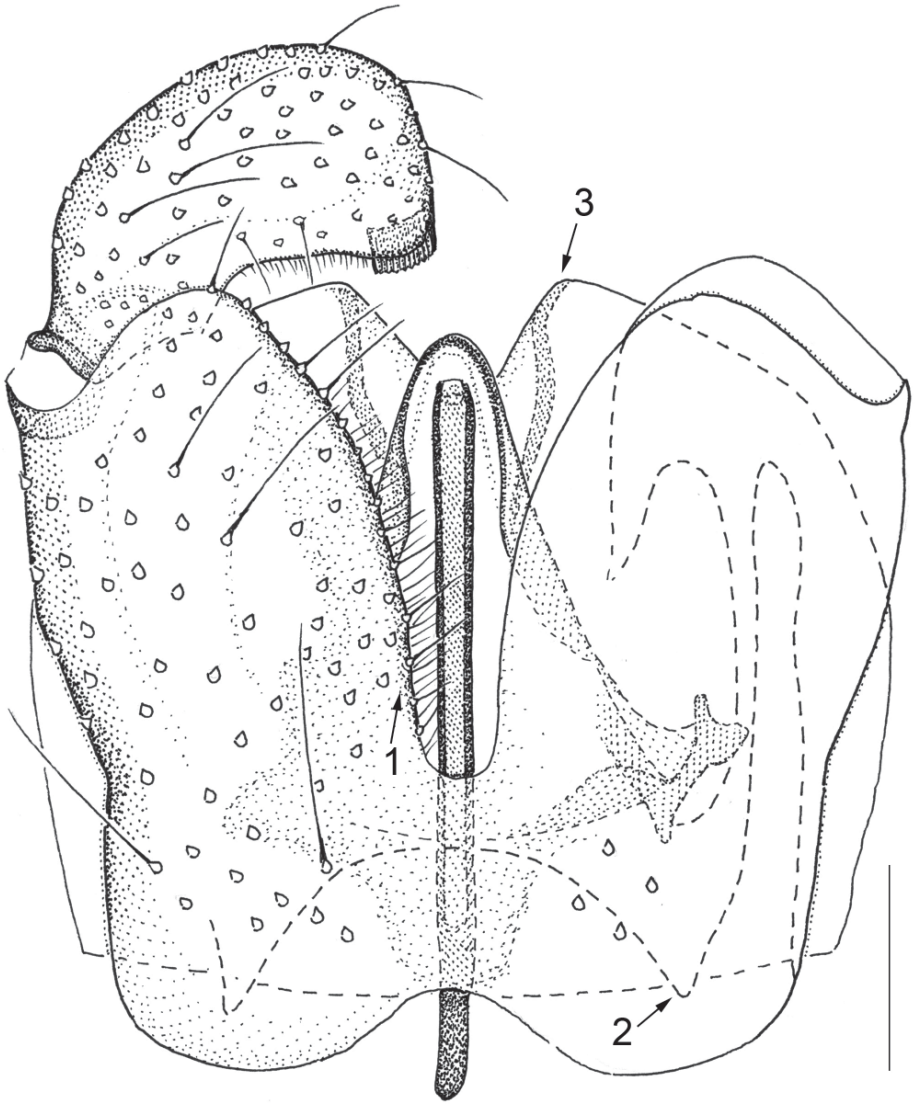

Fig. 3. *Winnertzia betulicola* Mamaev, 1963, ♂ (ZSM-DIP-42309-G09), terminalia, ventral view. Scale line: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

toned, the gonostyli being yellowish, the rest brown. Apart from that, the terminalia are characterized by the following peculiarities (Fig. 3): the large, slightly dorsad-directed and bent gonostylus has a small cluster of dark spines apically that form an irregular comb; of the gonocoxal synsclerite, the ventral emargination is unusually deep and narrow, the medial bridges are conspicuously densely covered with fine setae (↓[1]), and the dorsal apodemes end in short, subtriangular processes (↓[2]); the ninth tergite has a distinct, broadly V-shaped incision posteriorly and a pair of densely microtrichose lobes inside whose margins (towards the incision) appear as dark, seemingly sclerotized ridges (↓[3]).

DNA barcode

CO1 sequences (651–653bp) of the five specimens listed below are available in BIN BOLD:ACV0725. A search in BOLD's BIN Database retrieved a further match for this BIN, as Diptera sp. from Rhineland-Palatinate, Germany (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Waldaschaffer Forst; 49°96′92″ N, 9°35′64″ E; elev. 445 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10531-21; ZSM-DIP-42309-G09 • 1 ♂; same data as for preceding; BOLD GBDTA10532-21; ZSM-DIP-42309-G10 • 1 ♂; same data as for preceding; BOLD GBDTA10533-21; ZSM-DIP-42309-G11 • 1 ♂; same data as for preceding; BOLD GBDTA10534-21; ZSM-DIP-42309-G12 • 1 ♂; München, Perlacher Forst; 48°08′50″ N, 11°58′85″ E; elev. 551 m; 18 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10548-21; ZSM-DIP-42310-A03.

Distribution

Germany (new record); European and Far Eastern parts of Russia (Gagné & Jaschhof 2021).

Winnertzia bicolor Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (652–653bp) of the three specimens detailed below are available in BIN BOLD:AEX1156. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 17–24 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8759-22; ZSM-DIP-42477-B07 • 1 ♂; same data as for preceding but 48°91′61″ N, 8°33′18″ E; elev. 111 m; 10–17 May 2020; windthrow of birch trees; BOLD DTIII8878-22; ZSM-DIP-42478-D07. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow; BOLD GBDTA10455-21; ZSM-DIP-42309-A05.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia brevipalpata Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652–656bp) obtained of the three specimens listed below were allocated to two different BINs, BOLD:AER2287 (ZSM-DIP-42310-A02) and BOLD:ADW4104 (ZSM-DIP-42309-A06, ZSM-DIP-42310-B03). A search in BOLD's BIN Database retrieved 19 matches for BOLD:ADW4104, all as Cecidomyiidae sp. from Germany (accessed 25 Aug. 2023). Although the genetic clustering was found to be unsupported by morphological evidence, studies in the future should attempt to DNA barcode more specimens of *W. brevipalpata* to gain clarity about the extent and nature of the genetic variation found here.

Material examined

GERMANY – **Bavaria** • 1 ♂; Bamberg; 49°85′62″ N, 10°89′89″ E; elev. 282 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10547-21; ZSM-DIP-42310-A02 • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow; BOLD GBDTA10456-21; ZSM-DIP-42309-A06 • 1 ♂; Lower Franconia, Kolitzheim; 49°92′17″ N, 10°23′42″ E; elev. 229 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10560-21; ZSM-DIP-42310-B03.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia bulbifera Mamaev, 1963 agg.

Morphological identification

Jaschhof & Jaschhof (2020b) made clear that *W. bulbifera* sensu Jaschhof & Jaschhof (2013) is a complex of three discrete species, which, among others, differ in the shape of the gonostylus. Specimens studied here from Germany belong to "*bulbifera* C" in the paper by Jaschhof & Jaschhof (2020b: fig. 65), a potentially new species found earlier in Sweden. The genuine *W. bulbifera*, described by Mamaev (1963) from European Russia, is possibly identical with "*bulbifera* A" of Jaschhof & Jaschhof (2020b: fig. 63).

DNA barcode

CO1 sequences (640–652bp) of the three specimens detailed below are available in BIN BOLD:ADD4410° A search in BOLD's BIN Database retrieved a further match for this BIN, as *Winnertzia* sp. from Finland (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Kemnath; 49°82′54″ N, 11°96′34″ E; elev. 550 m; 11 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10535-21; ZSM-DIP-42309-H01 • 1 ♂; same data as for preceding; BOLD GBDTA10536-21; ZSM-DIP-42309-H02 • 1 ♂; same data as for preceding; BOLD GBDTA10537-21; ZSM-DIP-42309-H03.

Distribution

Germany (new record); Sweden, Finland, Latvia, European part of Russia (Gagné & Jaschhof 2021). The German occurrence of this species mentioned by Gagné & Jaschhof (2021) is based on a misidentification (Jaschhof & Jaschhof 2021b).

Winnertzia curvata Panelius, 1965

Morphological identification

Jaschhof & Jaschhof (2013, 2020b). The present project found, apart from the genuine *W. curvata*, several discrete *curvata*-like species, all likely unnamed, whose morphology is generally similar. One of these, here labeled *W*. sp. MJDE5 (BIN BOLD:ACR2981), was reported earlier as occurring in Sweden (Jaschhof & Jaschhof 2020b). The others are *W*. sp. MJDE45 (BIN BOLD:ADS9670), *W*. sp. MJDE46 (BIN BOLD:ACP8789), *W*. sp. MJDE47 (BIN BOLD:AER2276), and *W*. sp. MJDE48 (BINs BOLD: AEI1006 and BOLD:AER6232).

DNA barcode

CO1 sequences (653bp) of the two specimens detailed below are available in BIN BOLD:AEI1062. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°1830″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10387-21; ZSM-DIP-42308-C08 • 1 ♂; same data as for preceding but 47°93′87″ N, 11°18′63″ E; nutrient-poor meadow; BOLD GBDTA10461-21; ZSM-DIP-42309-A11°

Distribution

Germany (new record); UK, Sweden, Finland (Gagné & Jaschhof 2021).

Winnertzia discretella Spungis, 1992 agg.

Morphological identification

Jaschhof & Jaschhof (2013, 2020b). Jaschhof & Jaschhof (2020b), who studied a large material of this species from Sweden, referred to *W. discretella* as a morphologically unusually variable species. Contrary to this, the integrative study here led to the identification of 11 *discretella*-like species, each with distinct morphology and a discrete BIN. This renders the identity of the genuine *W. discretella*, a species described by Spungis (1992) from Latvia, an open question. No attempt was made here to resolve this issue and whether some or all of the *discretella*-like morphotypes found in Germany do occur in Sweden as well. Pending further research into this complex taxonomic problem, *W. discretella* is referred to as an unresolved species aggregate. The 11 *discretella*-like species found in Germany, including their DNA barcodes, are as follows: *W*. sp. MJDE9 (BIN BOLD:ADL7110), *W*. sp. MJDE40 (BIN BOLD:ADT1919), *W*. sp. MJDE41 (BIN BOLD:AER2294), *W*. sp. MJDE42 (BIN BOLD:AER2266), *W*. sp. MJDE43 (BIN BOLD:ACA9674), *W*. sp. MJDE44 (BIN BOLD:ACG8109), *W*. sp. MJDE51 (BIN BOLD:AER2253), *W*. sp. MJDE52 (BIN BOLD:AEX6572), *W*. sp. MJDE53 (BIN BOLD:AEX3123), *W*. sp. MJDE54 (BIN BOLD:AEY5112), and *W*. sp. MJDE55 (BIN BOLD:AEZ4619).

Distribution

Germany (new record); Sweden, Latvia, European and Far Eastern parts of Russia, South Korea (Gagné & Jaschhof 2021).

Winnertzia egregia Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

The CO1 sequence (652bp) of the specimen detailed below is available in BIN BOLD:ADT2599. A search in BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Deggendorf; 48°84′01″ N, 12°96′62″ E; elev. 377 m; 14 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10582-21; ZSM-DIP-42310-D01.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia ekdalensis Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; ZSM-DIP-42307-H02.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia feralis Mamaev, 2002

Morphological identification

Jaschhof & Jaschhof (2020b). Among the *Winnertzia* material studied here were four specimens of a species close to *W. feralis*, referred to here as *W*. sp. MJDE56 (BIN BOLD:ACP8730). This apparently unnamed species is not identical with either of the two *feralis*-like *Winnertzia* identified earlier in Sweden (Jaschhof & Jaschhof 2020b: 56, as "*tridens* D" and "*tridens* E").

DNA barcode

The CO1 sequence (653bp) of the specimen detailed below is available in BIN BOLD:ACP5877. A search in BOLD's BIN Database retrieved a further 30 matches for this BIN, all as Diptera sp. or Cecidomyiidae sp. from Norway (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Bamberg; 49°85′62″ N, 10°89′89″ E; elev. 282 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10556-21; ZSM-DIP-42310-A11.

Distribution

Germany (new record); Sweden, Ukraine (Gagné & Jaschhof 2021).

Winnertzia fraxinophila Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (652bp) of the two specimens detailed below are available in BIN BOLD:AER2280. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Apr. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Bavaria, Bad Griesbach im Rottal; 48°46′56″ N, 13°14′64″ E; elev. 474 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10528-21; ZSM-DIP-42309-G06 • 1 ♂; same data as for preceding; BOLD GBDTA10530-21; ZSM-DIP-42309-G08.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia fusca Kieffer, 1901

Morphological identification

Jaschhof & Jaschhof (2020b). In their revision of *Winnertzia* of Sweden, Jaschhof & Jaschhof (2020b) noticed some variation in terminalia characters of male *W. fusca*. The present project discovered two specimens of a possibly discrete, unnamed *Winnertzia* close to *W. fusca*, here labeled *W*. sp. MJDE59 (BIN BOLD:ACP6306). Reexamination of the morphology of the respective specimens from both Sweden and Germany is pending.

DNA barcode

CO1 sequences (653–654bp) of the two specimens detailed below are available in BIN BOLD:ACU8967. A search in BOLD's BIN Database retrieved a further two matches for this BIN, as Diptera sp. from Germany and Cecidomyiidae sp. from Belarus (accessed 25 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; BOLD GBDTA10487-21; ZSM-DIP-42309-D01 • 1 ♂; same data as for preceding; BOLD GBDTA10488-21; ZSM-DIP-42309-D02.

Distribution

Germany (new record); France, Sweden, Finland, Latvia, Far Eastern part of Russia (Gagné & Jaschhof 2021).

Winnertzia graduata Spungis, 1992

Morphological identification

Jaschhof & Jaschhof (2013, 2020b).

DNA barcode

*C*O1 sequences (651–652bp) of the two specimens detailed below are available in BIN BOLD:ADI3986. A search in BOLD's BIN Database retrieved one further match for this BIN, as *Winnertzia graduata* from Finland (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10386-21; ZSM-DIP-42308-C07 • 1 ♂; same data as for preceding; BOLD GBDTA10396-21; ZSM-DIP-42308-D05.

Distribution

Germany (new record); Sweden, Finland, Estonia, Latvia, Ukraine, possibly USA (Pennsylvania) (Gagné & Jaschhof 2021).

Winnertzia hamatula Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

The CO1 sequence (653bp) of the specimen detailed below is available in BIN BOLD:ACC0207. A search in BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Finland (accessed 25 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Gaggenau-Michelbach, Michelbach; 48°49′14″ N, 8°23′17″ E; elev. 340 m; 23 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; floodplain forest; BOLD GBDTA10496-21; ZSM-DIP-42309-D10.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia haushoferorum sp. nov.
urn:lsid:zoobank.org:act:97FAF377-52C5-4197-8C74-22C35ABBEB3C
Fig. 4

Diagnosis

Morphology

According to male terminalia characters, this medium-sized, brown *Winnertzia* is a representative of the *W. solidaginis* group and closely related to *W. quercinophila* Jaschhof & Jaschhof, 2020 (Jaschhof & Jaschhof 2020b: fig. 91), a species treated below. Terminalia structures characteristic of *W. haushoferorum* sp. nov. are as follows (Fig. 4A). The posterior margin of the ninth tergite is deeply indented medially (↓[1]), an unusual condition in *Winnertzia*, although shared with *W. quercinophila*. The gonostylus, which is strongly convex posteriorly, ends in a small nose-shaped bulge that bears a small pectinate tooth (↓[2]). The outline of the gonostylar apex is actually the most obvious distinction compared to *W. quercinophila*, in which a 'nose' is lacking and the pectinate tooth is markedly broader. The elongate-subtrapezoid tegmen is broadly rounded apically (↓[3]), not blunt-ended as in *W. quercinophila*, and has sharply contoured flaps ventrolaterally. The aedeagal apodeme is broadest on the basal half, then gradually narrowed, and broadened again at the apex, which is not as distinctly pointed as in *W. quercinophila*. Larvae and females of *W. haushoferorum* are unknown.

DNA barcode

CO1 sequences (642–652bp) of the type specimens specified below is available in BIN BOLD:AER2251. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Etymology

The name renders honor to the Haushofer family of Gut Hartschimmel, a long-standing farm in Upper Bavaria and the type locality of several of the new species described here, including *W. haushoferorum* sp. nov. The farming system of Gut Hartschimmel integrates effective measures to protect the rich biodiversity on the cultivated land, a fact reflected, among others, in an extraordinarily interesting fauna of mycophagous gall midges.

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA10321-21; ZSM-DIP-42307-F01.

Paratypes

GERMANY • 1 ♂; same data as for the holotype; BOLD GBDTA10326-21; ZSM-DIP-42307-F06 • 1 ♂; same data as for preceding but 47°93′99″ N, 11°18′30″ E; fen; BOLD GBDTA10377-21; ZSM-DIP-42308-B10 • 1 ♂; same data as for preceding; BOLD GBDTA10418-21; ZSM-DIP-42308-F03 • 1 ♂; same data as for preceding; BOLD GBDTA10421-21; ZSM-DIP-42308-F05 • 1 ♂; same data as for preceding; BOLD GBDTA10420-21; ZSM-DIP-42308-F06.

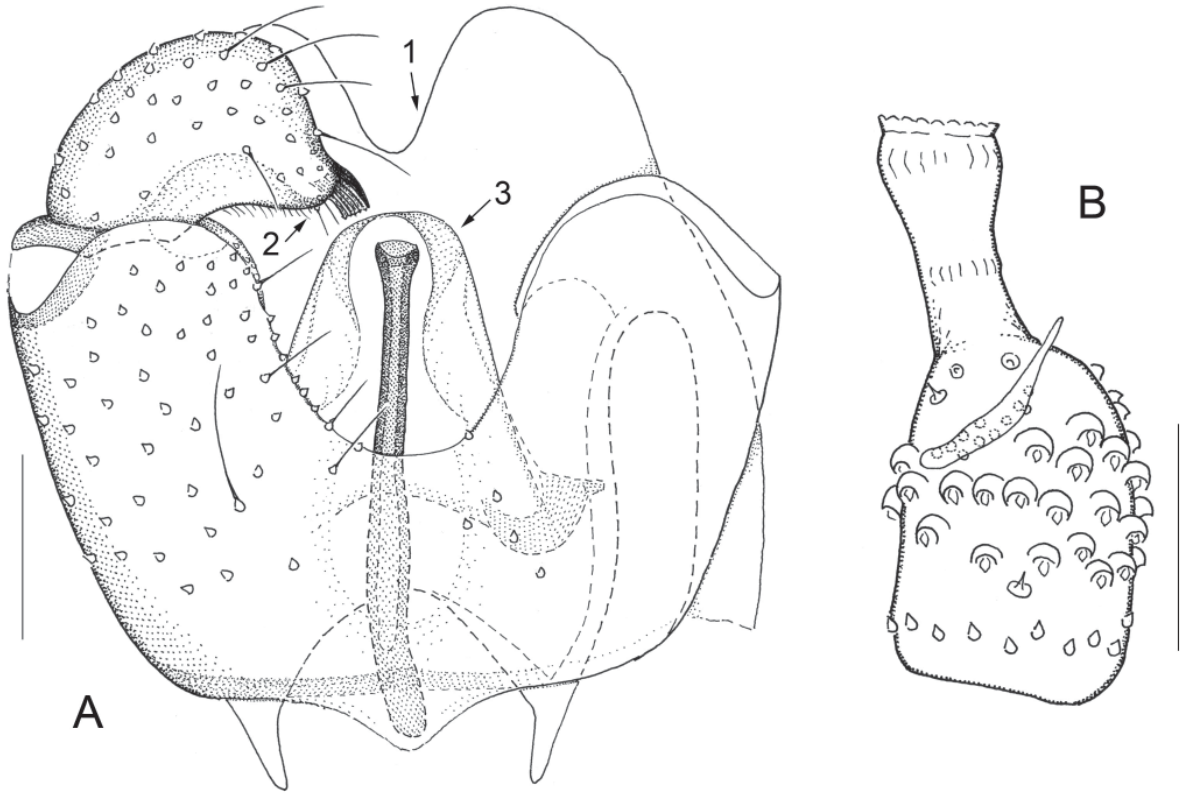

Fig. 4. *Winnertzia haushoferorum* sp. nov., holotype, ♂ (ZSM-DIP-42307-F01). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Other characters

Male

Body length. 2.0–2.3 mm.

Head. Eye bridge dorsally 3–4 ommatidia long. Antenna markedly shorter than body; scape larger than pedicel, both brighter than flagellum; 12 flagellomeres, translucent sensilla on flagellomeres 1–10. Fourth flagellomere with neck 0.6 × length of node, node 1.5 × as long as broad; sensory hairs numerous, translucent sensilla multiform, straight to U-shaped, occasionally even irregularly branched (Fig. 4B). Palpus slightly shorter than head height, 4 setae-bearing segments, fourth segment longest of all. Labella of normal size.

Thorax. Pronotal setae about 30. Anepimeral setae absent. Mediotergal lateral microtrichia a little enlarged. Parascutellar area bright, vaguely contoured.

Wing. About as long as body. Length / width ratio 2.2. Costal cell slightly reinforced. M_4 long, nearly straight, CuA strongly bent, both veins extending to wing margin.

Legs. With both pointed and blunt-ended scales. Basitarsal spines absent. Fore tibia and T_2 of nearly same length. Acropods: claws slightly bent, basal tooth large; empodia vestigial.

Abdomen. Pleural membrane with setae and scales.

Terminalia (Fig. 4A). Ninth tergite ¾ of gonopodal length, setae confined to posterior and lateral portions; margin of indentation broadly pigmented; anterior margin straight, indistinct. Gonocoxal synsclerite broader than long; ventral emargination U-shaped, sharply contoured and with large unsclerotized area basally; ventroanterior margin usually with small subtriangular outgrowth; dorso- and ventroposterior portions ending at same level; dorsal apodemes moderately long. Gonostylus very slightly bent, twice as long as broad; basolateral apophysis fairly large, angulate. Tegmen sharply contoured; parameral apodemes of normal size. Solid basal portion of aedeagal apodeme moderately long. Aedeagal bulge with closely spaced rows of tiny spikes.

Winnertzia imbecilla Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 28 Jun.–5 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42309-C08.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia incrassata sp. nov.
urn:lsid:zoobank.org:act:81F2BFB9-7783-4481-B74E-938964230EE0
Fig. 5

Diagnosis

Morphology

This new species exhibits all three character states typical of the *W. globifera* group (Jaschhof & Jaschhof 2020b): the gonostylar tooth is situated at some distance from the gonostylar apex, the dorsoposterior portions of the gonocoxae protrude markedly beyond the ventroposterior portions, and the tarsal claws lack a strong basal tooth. A feature unique of *W. incrassata* sp. nov. is that the aedeagal apodeme is clearly broadened apically (Fig. 5A, ↓[1]), not narrowed as in the other species of this group. Larvae and females of *W. incrassata* are unknown.

DNA barcode

CO1 sequences (652–697bp) of the type specimens specified below are available in BIN BOLD:AER2284. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 25 Aug. 2023).

Etymology

The specific epithet '*incrassata*', the Latin adjective for 'thickened', refers to the shape of the aedeagal apodeme characteristic of this species.

Type material

Holotype

GERMANY • ♂; Bavaria, Moos, Isar estuary; 48°77′90″ N, 12°94′98″ E; elev. 313 m; 12–25 Aug. 2021; GBOL and R. Albrecht leg.; Malaise trap; *Molinia caerulaea* meadow; BOLD GBDTA10615-21; ZSM-DIP-42310-F10.

Paratypes

GERMANY • 1 ♂; Bavaria, Munich, Allacher Lohe Nature Reserve; 48°20′06″ N, 11°48′35″ E; elev. 499 m; 4–19 Aug. 2021; GBOL and R. Albrecht leg.; Malaise trap; heathland; BOLD GBDTA10617-21; ZSM-DIP-42310-F12 • 1 ♂; same data as for preceding but 21 Jul.–4 Aug. 2021; BOLD GBDTA10618-21; ZSM-DIP-42310-G01 • 1 ♂; same data as for preceding; BOLD GBDTA10619-21; ZSM-DIP-42310-G02.

Other characters

Male

Body length. 2.0–2.3 mm.

Head. Eye bridge dorsally 2–3 ommatidia long. Antenna markedly shorter than body; scape larger than pedicel, both slightly darker than flagellum; 11 flagellomeres, translucent sensilla on flagellomeres 1–10. Fourth flagellomere with neck 1.2 × length of node, node 1.8 × as long as broad; sensory hairs numerous, translucent sensilla multiform, from straight to U- or Y-shaped (Fig. 5B). Palpus shorter than head height, 3 or 4 setae-bearing segments depending on whether fourth segment is separate or merged with third, if merged then apical segment by far the longest of all. Labella conspicuously small.

Thorax. Pronotal setae 7–10. Anepimeral setae absent. Mediotergal lateral microtrichia markedly enlarged. Parascutellar area bright, vaguely contoured.

Wing. Markedly longer than body. Length / width ratio 2.7. Costal cell slightly reinforced. Costal break indistinct. M_4 very faint, CuA strongly bent apically, both veins declining before wing margin.

Legs. With pointed scales. Basitarsal spines absent. Fore tibia 1.3 × length of T_2. Acropods: claws slightly bent, empodia vestigial.

Abdomen. Slender. Pleural membrane devoid of vestiture.

Terminalia (Fig. 5A). Ninth tergite ¾ of gonopodal length, setae confined to posterior half; posterior margin straight, with pigmented area medially; anterior margin straight, indistinct. Gonocoxal synsclerite as long as broad; a large portion ventroanteriorly glabrous; ventral emargination U-shaped, sharply contoured, surrounded by diffuse, darkly pigmented area of variable extent (not illustrated); ventroanterior margin membranous, broadly rounded; dorsoposterior portions subtriangular; dorsal apodemes thick, moderately long. Gonostylus 2.5 × as long as broad, strongly narrowed subbasally; basolateral apophysis small, slightly angulated; subapical tooth pectinate, of moderate size, obliquely aligned. Tegmen sharply contoured, rounded apically; flaps with distinct, reinforced margins; parameral apodemes of normal size. Solid basal portion of aedeagal apodeme moderately long, transition to distal portion smooth. Aedeagal bulge with closely spaced rows of tiny spikes.

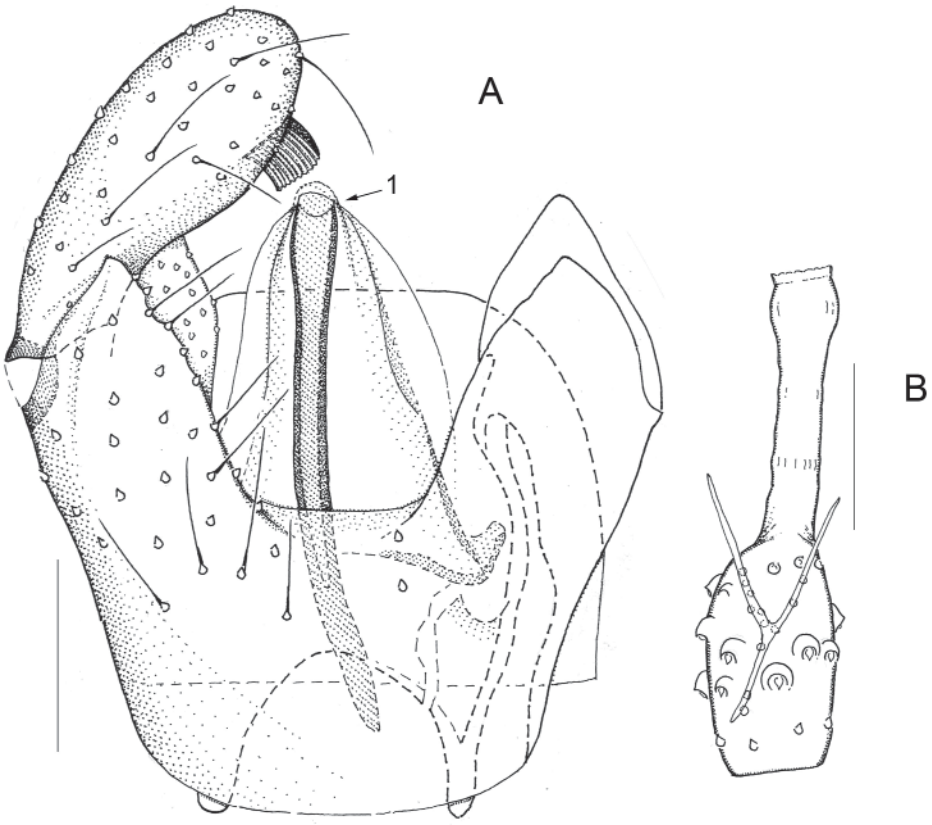

Fig. 5. *Winnertzia incrassata* sp. nov., holotype, ♂ (ZSM-DIP-42310-F10). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrow indicates a diagnostic character (see text).

Winnertzia inornata Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

The CO1 sequence (652bp) of the specimen detailed below is available in BIN BOLD:ADW6527. A search in BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Bavaria, Germany (accessed 25 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA10469-21; ZSM-DIP-42309-B07.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia longiptera Mamaev, 2002

Morphological identification

Jaschhof & Jaschhof (2013, 2020b). According to the results obtained here, *W. longiptera* belongs to a group of several species with generally similar male morphology. This corresponds with the situation found earlier in Sweden (Jaschhof & Jaschhof 2020b). For the moment it is unclear whether the same sibling species occur in both countries, and whether they are unnamed or just unrecognizable from the literature.

DNA barcode

CO1 sequences (640–653bp) of the nine specimens detailed below are available in BIN BOLD:ACG5730. A search in BOLD's BIN Database retrieved five further matches for this BIN, all as Cecidomyiidae sp. from Norway (three matches) and Bavaria, Germany (two) (accessed 25 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 7 Dec. 2018; D. Doczkal leg.; Malaise trap; BOLD DTIII8564-22; ZSM-DIP-42475-B02 • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA10322-21; ZSM-DIP-42307-F02 • 1 ♂; same data as for preceding; BOLD GBDTA10324-21; ZSM-DIP-42307-F04 • 1 ♂; same data as for preceding; BOLD GBDTA10335-21; ZSM-DIP-42307-G03 • 1 ♂; same data as for preceding; BOLD GBDTA10340-21; ZSM-DIP-42307-G08 • 1 ♂; same data as for preceding; BOLD GBDTA10342-21; ZSM-DIP-42307-G10 • 1 ♂; same data as for preceding but 47°94′23″ N, 11°18′30″ E; fen; BOLD GBDTA10459-21; ZSM-DIP-42309-A09 • 1 ♂; Lower Franconia, Rauhenebrach; 49°91′82″ N, 10°56′03″ E; elev. 366 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10515-21; ZSM-DIP-42309-F05 • 1 ♂; Upper Bavaria, Ebersberg, Ebersberger Forst; 48°10′69″ N, 11°95′30″ E; elev. 569 m; 11 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10575-21; ZSM-DIP-42310-C06.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia macrodens sp. nov.
urn:lsid:zoobank.org:act:B10E97E1-8F8F-461B-A391-680780A28B57
Fig. 6

Diagnosis

Morphology

A further new species of the *W. globifera* group (Jaschhof & Jaschhof 2020b), *W. macrodens* sp. nov. is distinguished by several male terminalia characters occurring in combination (Fig. 6A). The gonostylus, which is unusually strongly narrowed subbasally, bears a slightly obliquely aligned pectinate tooth of considerable size (↓[1]). The posterior margin of the ninth tergite has a wide shallow emargination (↓[2]). The aedeagal apodeme has an abrupt broadening beyond the solid basal portion and a long, strongly narrowed apical portion (↓[3]). Larvae and females of *W. macrodens* are unknown.

DNA barcode

CO1 sequences (651–652bp) were obtained of the type specimens specified below and allocated to BIN BOLD:ADW3425. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Etymology

The specific epithet '*macrodens*', a noun in apposition, marks the conspicuously large gonostylar tooth found in this species.

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev.117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA10466-21; ZSM-DIP-42309-B04.

Paratype

GERMANY • 1 ♂; same data as for the holotype but 28 Jun.–5 Jul. 2020; BOLD GBDTA10481-21; ZSM-DIP-42309-C07.

Other characters

Male

Body length. 1.4 mm.

Head. Eye bridge dorsally 1–2 ommatidia long. Antenna markedly shorter than body; scape and pedicel of same size, both concolorous with flagellum; 12 flagellomeres, translucent sensilla on flagellomeres 1–8. Fourth flagellomere with neck 0.8× length of node, node 1.8× as long as broad; sensory hairs fairly sparse, translucent sensilla multiform, either straight, variously U-shaped or irregularly branched (Fig. 6B). Palpus shorter than head height, with 4 setae-bearing segments, apical segment longest of all. Labella small.

Thorax. Pronotal setae 5–6. Anepimeral setae absent. Mediotergal lateral microtrichia markedly enlarged. Parascutellar area bright, sharply contoured.

Wing. Shorter than body. Length / width ratio 2.6. Costal cell slightly reinforced. M_4 long, faint, almost straight; CuA slightly bent apically, both veins extending to wing margin.

Legs. With pointed scales. Basitarsal spines absent. Fore tibia 1.2× length of T_2. Acropods: claws slightly bent, toothless; empodia vestigial.

Abdomen. Pleural membrane devoid of vestiture.

Terminalia (Fig. 6A). Ninth tergite one half of gonopodal length, setae confined to posterior half; anterior margin straight, indistinct. Gonocoxal synsclerite slightly broader than long; a large portion ventroanteriorly glabrous; ventral emargination U-shaped, sharply contoured, without membranous area basally; ventroanterior margin distinct, broadly rounded; dorsoposterior portions narrowly rounded, slightly protruding beyond ventroposterior portions; dorsal apodemes thin, moderately long, widely separated from each other. Gonostylus 2.5× as long as broad; basolateral apophysis small, slightly angulated. Tegmen subtriangular, sharply contoured; flaps with distinct margins; parameral apodemes small. Solid basal portion of aedeagal apodeme short. Aedeagal bulge with closely spaced rows of tiny spikes.

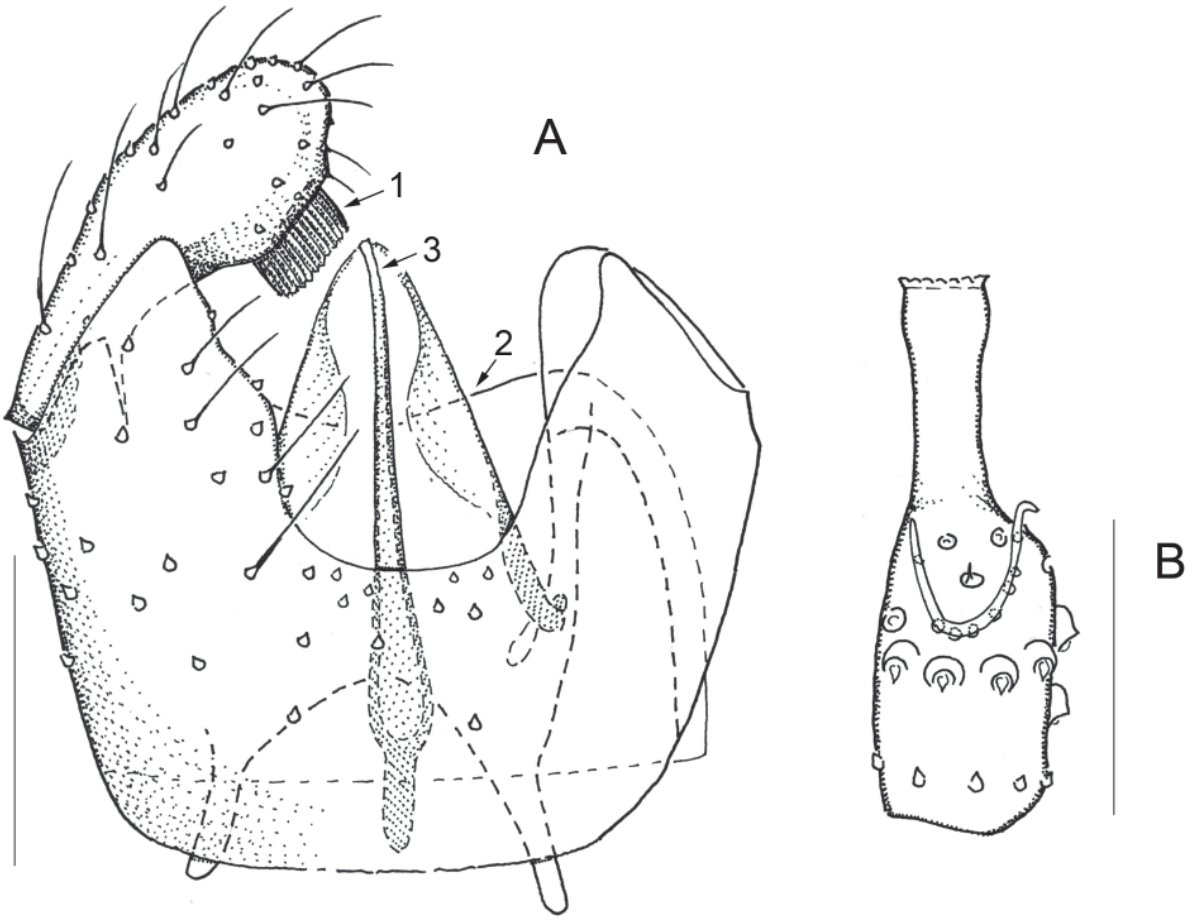

Fig. 6. *Winnertzia macrodens* sp. nov., holotype, ♂ (ZSM-DIP-42309-B04). **A**. Terminalia, ventral view. **B**. Third flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Winnertzia nigra Mamaev, 1963

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (640bp) of the specimen detailed below is available in BIN BOLD:AER2246. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′17″ N, 8°33′20″ E; 114 m elev.; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of aspen trees; BOLD GBDTA10505-21; ZSM-DIP-42409-E07.

Distribution

Germany (new record); UK, Sweden, Latvia, Ukraine, European and Far Eastern parts of Russia (Gagné & Jaschhof 2021).

Winnertzia nigripennis Kieffer, 1896

Morphological identification

Jaschhof & Jaschhof (2013, 2020b). *Winnertzia nigripennis* is one of several species with generally similar male morphology.

While a taxonomic study of *Winnertzia* in Sweden had revealed three presumably unnamed *nigripennis*-like species (Jaschhof & Jaschhof 2020b), results obtained in the present project suggest the presence of 11 discrete sibling species solely in southern Germany, which can be separated by both morphological and molecular characters. These species, of which several are represented by singletons only, are labeled here *W*. sp. MJDE2 (BIN BOLD:ACU9822), *W*. sp. MJDE31 (BIN BOLD:ACR3885), *W*. sp. MJDE32 (BIN BOLD:AER2249), *W*. sp. MJDE33 (BIN BOLD:AER2254), *W*. sp. MJDE34 (BIN BOLD:AER2259), *W*. sp. MJDE35 (BIN BOLD:AER2267), *W*. sp. MJDE36 (BIN BOLD:AER2255), *W*. sp. MJDE37 (BIN BOLD:ADD4411), *W*. sp. MJDE38 (BIN BOLD:AER2291), *W*. sp. MJDE39 (BIN BOLD:AER2290), and *W*. sp. MJDE58 (BIN BOLD:AEX7527). To resolve this complex taxonomic situation sets a further task for *Winnertzia* revisions in the future.

DNA barcode

CO1 sequences (632–652bp) were obtained of the four specimens detailed below and allocated to two different BINs: BOLD:AER2256 (ZSM-DIP-42309-H09) and BOLD:ACJ3412 (ZSM-DIP-42308-H10, ZSM-DIP-42309-H07, ZSM-DIP-42309-H08). Reexamination of the respective physical specimens did not reveal clear morphological differences between the two genetic clusters. A search in BOLD's BIN Database retrieved a further four matches for BOLD:ACJ3412, as Cecidomyiidae sp. from Rhineland-Palatinate and Bavaria, Germany (three matches) and *Winnertzia nigripennis* from an unknown country (mined from GenBank) (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg; Malaise trap; nutrient-poor meadow; BOLD GBDTA10449-21; ZSM-DIP-42308-H10 • 1 ♂; Swabia, Esterholz; 48°64′17″ N, 11°01′88″ E; elev. 485 m; 15 Jul. 2019;

LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10541-21; ZSM-DIP-42309-H07 • 1 ♂; same data as for preceding; BOLD GBDTA10542-21; ZSM-DIP-42309-H08 • 1 ♂; same data as for preceding; BOLD GBDTA10543-21; ZSM-DIP-42309-H09.

Distribution

Germany (new record); widespread in Europe, South Korea, possibly USA (Pennsylvania) (Gagné & Jaschhof 2021).

Winnertzia padicola Spungis, 1992

Morphological identification

Jaschhof & Jaschhof (2013, 2020b).

DNA barcode

The CO1 sequence (644bp) of the specimen detailed below is available in BIN BOLD:ADM3767. A search in BOLD's BIN Database retrieved two further matches for this BIN, both as Cecidomyiidae sp. from Belarus (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10369-21; ZSM-DIP-42308-B02.

Distribution

Germany (new record); Sweden, Latvia (Gagné & Jaschhof 2021).

Winnertzia parvidens Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Rimpar; 49°85′93″ N, 9°95′34″ E; elev. 279 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42310-B08.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia parvispina Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013, 2020b).

DNA barcode

CO1 sequences (651–653bp) of the two specimens detailed below are available in BIN BOLD:AER2263. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg; Malaise trap; fen; BOLD GBDTA10403-21; ZSM-DIP-42308-D12 • 1 ♂; same data as for preceding; BOLD GBDTA10410-21; ZSM-DIP-42308-E07.

Distribution

Germany (new record); Sweden, Czech Republic (Gagné & Jaschhof 2021).

Winnertzia pilosistylus Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (640–642bp) of the two specimens detailed below are available in BIN BOLD:AER2247. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg; Malaise trap; fen; BOLD GBDTA10375-21; ZSM-DIP-42308-B08 • 1 ♂; München, Perlacher Forst; 48°08′50″ N, 11°58′85″ E; elev. 551 m; 18 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10550-21; ZSM-DIP-42310-A05.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia pratensis Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (651–653bp) obtained of the five specimens detailed below were allocated to two different BINs: BOLD:AER2264 (ZSM-DIP-42308-A01, ZSM-DIP-42308-C12, ZSM-DIP-42475-B01) and BOLD:AER2272 (ZSM-DIP-42307-H09, ZSM-DIP-42308-A07). Reexamination of the specimens did not reveal morphological differences between the two genetic clusters. A search on BOLD's BIN Database retrieved no further results for these BINs (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg; Malaise trap; nutrient-poor pasture; BOLD GBDTA10353-21; ZSM-DIP-42307-H09 • 1 ♂; same data as for preceding but 47°94′15″ N, 11°18′26″ E; 8 May–5 Jun. 2020; fen; BOLD GBDTA10356-21; ZSM-DIP-42308-A01 • 1 ♂; same data as for preceding; BOLD GBDTA10362-21; ZSM-DIP-42308-A07 • 1 ♂; same data as for preceding but 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; BOLD GBDTA10391-21; ZSM-DIP-42308-C12 • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 27 Jun.–12 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; BOLD DTIII8563-22; ZSM-DIP-42475-B01.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia pustulatula Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (651–652bp) of the four specimens detailed below are available in BIN BOLD:ADX6865. A search in BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Bavaria, Germany (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Allgäu, Balderschwang, Leiterberg; 47°48′58″ N, 10°08′99″ E; elev. 1290 m; 17 May–3 Jun. 2017; D. Doczkal and J. Voith leg.; Malaise trap; BOLD DTIII8470-22; ZSM-DIP-42474-B03 • 1 ♂; same data as for preceding; BOLD DTIII8473-22; ZSM-DIP-42474-B06 • 1 ♂; same data as for preceding; BOLD DTIII8475-22; ZSM-DIP-42474-B08 • 1 ♂; same data as for preceding; BOLD DTIII8478-22; ZSM-DIP-42474-B11.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia quercinophila Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (651–652bp) of the five specimens detailed below are available in BIN BOLD:AEI4017. A search in BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10379-21; ZSM-DIP-42308-B12 • 1 ♂; Upper Bavaria, Ebersberg, Ebersberger Forst; 48°10′69″ N, 11°95′30″ E; elev. 569 m; 11 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10569-21; ZSM-DIP-42310-B12 • 1 ♂; same data as for preceding; BOLD GBDTA10571-21; ZSM-DIP-42310-C02 • 1 ♂; same data as for preceding; BOLD GBDTA10573-21; ZSM-DIP-42310-C04 • 1 ♂; same data as for preceding; BOLD GBDTA10576-21; ZSM-DIP-42310-C07.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia setosa Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (641–651bp) of the two specimens detailed below are available in BIN BOLD:ADL8182. A search in BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Belarus (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow; BOLD GBDTA10453-21; ZSM-DIP-42309-A03 • 1 ♂; Lower Franconia, Rauhenebrach; 49°91′82″ N, 10°56′03″ E; elev. 366 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10511-21; ZSM-DIP-42309-F01.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia silvestris Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b). The specimen from Germany studied here fits the description of *W. silvestris* by Jaschhof & Jaschhof (2020b) except for the empodia, which are vestigial, not half as long as those found in the original material from Sweden.

DNA barcode

The CO1 sequence (652bp) of the specimen detailed below is available in BIN BOLD:AER2273. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 10–17 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; BOLD DTIII8886-22; ZSM-DIP-42478-E03.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia smalandensis Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (640–651bp) of the five specimens detailed below are available in BIN BOLD:ACN2753. A search in BOLD's BIN Database retrieved a further seven matches for this BIN, as Cecidomyiidae sp.

from Russia (three matches) and Bulgaria (three), and as Diptera sp. from Mecklenburg-Vorpommern, Germany (one match) (accessed 2 May 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Deggendorf; 48°84′01″ N, 12°96′62″ E; elev. 377 m; 14 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10578-21; ZSM-DIP-42310-C09 • 1 ♂; Lower Bavaria, Rain; 48°64′61″ N, 11°01′89″ E; elev. 429 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10606-21; ZSM-DIP-42310-F01 • 1 ♂; same data as for preceding; BOLD GBDTA10608-21; ZSM-DIP-42310-F03 • 1 ♂; same data as for preceding; BOLD GBDTA10610-21; ZSM-DIP-42310-F05 • 1 ♂; same data as for preceding; BOLD GBDTA10613-21; ZSM-DIP-42310-F08.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Winnertzia solidaginis Felt, 1907 agg.

Morphological identification

Jaschhof & Jaschhof (2013, 2020b). Jaschhof & Jaschhof (2020b) treated *W. solidaginis* as an aggregate of several discrete species and explained the complexity of this taxonomic issue. The situation as depicted at that time persists unchanged: diagnostic characters of the genuine, originally Nearctic *W. solidaginis* are unclear, as are the number and morphological characteristics of its sibling species. Integrative study conducted here revealed 12 different BINs for *solidaginis*-like specimens from southern Germany, which however are only partly supported by clear-cut morphological distinctions: *W*. sp. MJDE4 (BIN BOLD:ACG6177), *W*. sp. MJDE6 (no CO1 sequence obtained, specimen ZSM-DIP-42307-G05); *W*. sp. MJDE8 (BIN BOLD:AER7056), *W*. sp. MJDE16 (BIN BOLD:ACF8767 and BIN BOLD:AEH9116), *W*. sp. MJDE19 (BIN BOLD:ACG3486), *W*. sp. MJDE19A (BIN BOLD:AER2285), *W*. sp. MJDE19B (BIN BOLD:AER2281), *W*. sp. MJDE19C (BIN BOLD:AER2295), *W*. sp. MJDE19D (BIN BOLD:ADM4238), *W*. sp. MJDE19E (BIN BOLD:AEX3196), *W*. sp. MJDE61 (BIN BOLD:ADN9678), and *W*. sp. MJDE62 (BIN BOLD:ACR2954 and BOLD:AEH9430).

Distribution

Germany (new record); widespread Holarctic (Gagné & Jaschhof 2021).

Winnertzia subdentata sp. nov.
urn:lsid:zoobank.org:act:B2ADA399-FDB9-470F-891F-4519B673891B
Fig. 7

Differential diagnosis

Morphology

Winnertzia subdentata sp. nov. closely resembles *W. dentata* Jaschhof & Jaschhof, 2020, a species known exclusively from southeastern Sweden (Jaschhof & Jaschhof 2020b). Differences in the male morphology of both species are as follows (females and larvae are unknown). The most important distinction is that the gonostylar apex of *W. subdentata* is convex (rounded) and equipped with 2, perhaps even 3 thick, closely spaced spines that upon first sight might appear as one small, solid tooth (↓[1], Fig. 7A), whereas the gonostylus of *W. dentata* is distinctly blunt-ended and indeed equipped with a single solid tooth that is two or three times as large as an ordinary spine (Jaschhof & Jaschhof 2020b: fig. 43). Less striking is that the basolateral apophysis of the gonostylus is smaller in *W. subdentata* compared with *W. dentata* (↓[2]). Both species are nearly identical in non-terminalia characters.

The number of flagellomeres in *W. subdentata* is either 11 (paratype, body length 1.7 mm) or 12 (holotype, body length 2.5 mm), and in both specimens translucent sensilla are present on flagellomeres 1–10, whereas the single specimen known of *W. dentata* has 11 flagellomeres, with the apical flagellomere long and subdivided, and translucent sensilla on flagellomeres 1–9 (Jaschhof & Jaschhof 2020b).

DNA barcode

CO1 sequences (641–652bp) of the type specimens are available in BIN BOLD:ACG4326. A search in BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Bavaria, Germany (accessed 26 Aug. 2023).

Etymology

The name '*subdentata*', which in a broader sense means 'beside *dentata*', refers to the close resemblance of the two species.

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°93′88″ N, 11°18′44″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA10432-21; ZSM-DIP-42308-G05.

Paratype

GERMANY • 1 ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA10468-21; ZSM-DIP-42309-B06.

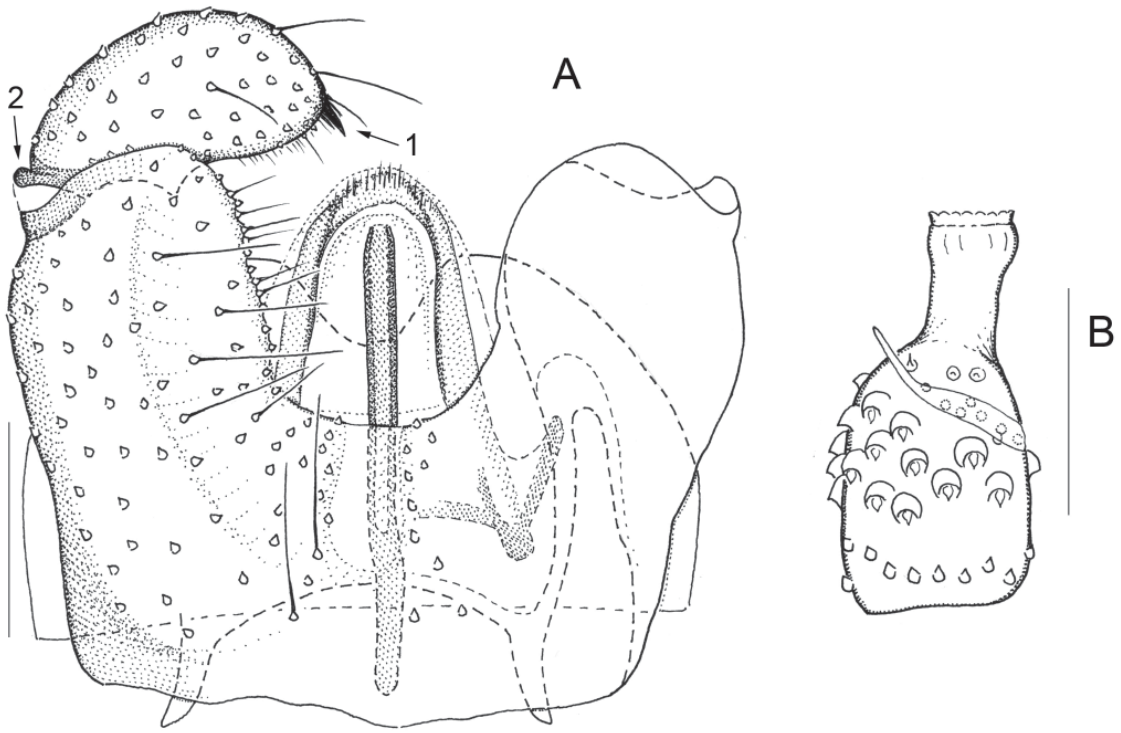

Fig. 7. *Winnertzia subdentata* sp. nov. **A**. Holotype, ♂, terminalia, ventral view (ZSM-DIP-42308-G05). **B**. Paratype, ♂, fourth flagellomere, lateral view (ZSM-DIP-42309-B06). Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Winnertzia tridens Panelius, 1965

Morphological identification

Jaschhof & Jaschhof (2020b).

DNA barcode

CO1 sequences (651–657bp) of the 18 specimens listed below are available in BIN BOLD:ADX7219. A search in BOLD's BIN Database retrieved a further three matches for this BIN, as Cecidomyiidae sp. from Bavaria, Germany (accessed 3 May 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Gaggenau-Michelbach, Michelbach; 48°49′14″ N, 8°23′17″ E; elev. 340 m; 23 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; floodplain forest; BOLD GBDTA10494-21; ZSM-DIP-42309-D08 • 1 ♂; Malsch, NE of Kieswerk Glaser; 48°54′52″ N, 8°18′46″ E; 27 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; beech log in forest clearing; BOLD GBDTA10498-21; ZSM-DIP-43309-D12 • 1 ♂; same data as for preceding; BOLD GBDTA10502-21; ZSM-DIP-43309-E04. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA10392-21; ZSM-DIP-42308-D01 • 1 ♂; same data as for preceding; BOLD GBDTA10414-21; ZSM-DIP-42308-E11 • 1 ♂; Germaringen; 47°96′30″ N, 10°67′62″ E; elev. 650 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10509-21; ZSM-DIP-42309-E11 • 1 ♂; Lower Bavaria, Bad Griesbach im Rottal; 48°46′56″ N, 13°14′64″ E; elev. 474 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10524-21; ZSM-DIP-42309-G02 • 1 ♂; same data as for preceding; BOLD GBDTA10525-21; ZSM-DIP-42309-G03 • 1 ♂; same data as for preceding; BOLD GBDTA10526-21; ZSM-DIP-42309-G04 • 1 ♂; Deggendorf; 48°84′01″ N, 12°96′62″ E; elev. 377 m; 14 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10586-21; ZSM-DIP-42310-D05 • 1 ♂; Lower Franconia, Bobingen; 48°27′18″ N, 10°84′03″ E; elev. 524 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10590-21; ZSM-DIP-42310-D09 • 1 ♂; same data as for preceding; BOLD GBDTA10591-21; ZSM-DIP-42310-D10 • 1 ♂; same data as for preceding; BOLD GBDTA10593-21; ZSM-DIP-42310-D12 • 1 ♂; same data as for preceding; BOLD GBDTA10595-21; ZSM-DIP-42310-E02 • 1 ♂; same data as for preceding; BOLD GBDTA10604-21; ZSM-DIP-42310-E11 • 1 ♂; same data as for preceding; BOLD GBDTA10605-21; ZSM-DIP-42310-E12 • 1 ♂; Munich, Allacher Lohe Nature Reserve; 48°20′06″ N, 11°48′35″ E; elev. 499 m; 23 Jun.–5 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; heathland; BOLD GBDTA10616-21; ZSM-DIP-42310-F11 • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 27 Jun.–12 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; BOLD DTIII8567-22; ZSM-DIP-42475-B05.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Winnertzia xylostei Mamaev, 1963 agg.

Morphological identification

Jaschhof & Jaschhof (2020b). *Winnertzia xylostei* as treated by Jaschhof & Jaschhof (2013) was subsequently shown to be an aggregate of three morphotypes (Jaschhof & Jaschhof 2020b). The diagnostic characters of the genuine *W. xylostei*, a species described by Mamaev (1963), have yet to be specified.

DNA barcode

CO1 sequences (651–725bp) obtained of the five specimens detailed below were allocated to two BINs: BOLD:ACC8240 (ZSM-DIP-42307-H10, ZSM-DIP-42477-G03) and BOLD:AEA0752 (ZSM-DIP-42307-G09, ZSM-DIP-42307-H03, ZSM-DIP-42307-H05). All five specimens belong to the same morphotype, referred to as "*xylostei* B" by Jaschhof & Jaschhof (2020b), and four of them were found in the same Malaise trap sample. Search on BOLD's BIN Database retrieved seven matches for BOLD:ACC8240, all as Cecidomyiidae sp. from Canada (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′22″ E; 10–17 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of aspen trees; BOLD DTIII8815-22; ZSM-DIP-42477-G03. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA10341-21; ZSM-DIP-42307-G09 • 1 ♂; same data as for preceding; BOLD GBDTA10347-21; ZSM-DIP-42307-H03 • 1 ♂; same data as for preceding; BOLD GBDTA10349-21; ZSM-DIP-42307-H05 • 1 ♂; same data as for preceding; BOLD GBDTA10354-21; ZSM-DIP-42307-H10.

Distribution

Germany (new record); Sweden, European and Far Eastern parts of Russia (Gagné & Jaschhof 2021).

Subfamily **Porricondylinae** Kieffer, 1913

There is every indication that this is the most taxonomically diverse of the mycophagous subfamilies of Cecidomyiidae. Its 571 named extant species are classified in 88 genera, whereas the 615 species known of Micromyinae are accomodated in just 41 genera (Gagné & Jaschhof 2021). Each of the three tribes – Dicerurini Mamaev, 1966, Porricondylini Kieffer, 1913, and Asynaptini Rübsaamen & Hedicke, 1926 – is rich in genera and species, with Porricondylini being the largest and most complex tribe (Jaschhof & Jaschhof 2013). The Porricondylinae of Europe previously comprised 53 genera and 272 species, of which 21 genera and 40 species were known from Germany (Jaschhof & Jaschhof 2021b). New additions to the German fauna detailed here amount to 21 genera and 100 species, of which one genus and 24 species are new to science.

Tribe **Asynaptini** Rübsaamen & Hedicke, 1926

Of eight genera of Asynaptini found in Europe, *Asynapta* Loew, 1850 and *Camptomyia* Kieffer, 1894 are by far the largest (Gagné & Jaschhof 2021). Both were in the past shown to occur in Germany, along with *Colomyia* Kieffer, 1892 and *Stackelbergiella* Marikovskij, 1958 (Jaschhof & Jaschhof 2021b). New additions to the German fauna reported here are *Parasynapta* Panelius, 1965 and *Svenartia* Jaschhof, 2013, two little-known, species-poor genera. The Asynaptini of northern Europe were recently reviewed by Jaschhof & Jaschhof (2019b).

Genus ***Asynapta*** Loew, 1850

This genus had previously 49 species in the world, 19 in Europe and five in Germany (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021b, 2022). Two new *Asynapta* are described here, which, together with three first-time records, raises the number of species known from Germany to ten. Males of *Asynapta* in Europe can be identified using the revisions by Spungis (1988) and Jaschhof & Jaschhof (2013, 2019b).

Asynapta baltica Spungis, 1988

Morphological identification

Jaschhof & Jaschhof (2019b).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; ZSM-DIP-42304-B07.

Distribution

Germany (new record); Sweden, Latvia, Ukraine (Gagné & Jaschhof 2021).

Asynapta doczkali sp. nov.
urn:lsid:zoobank.org:act:9C156180-39E1-4B2F-8007-C5656068E1C1
Fig. 8

Diagnosis

Morphology

A typical *Asynapta*, this new species is distinguished from congeners in male terminalia structures, as follows (Fig. 8A). Of the gonostylus, the posterior margin is strongly convex (↓[1]) and the pectinate tooth of moderate size is located entirely apically, rendering it only vaguely visible ventrally. The ventral parameres form an X-shape whose posterior branches are serrate apically and interconnected by a thin, medially split membrane (↓[2]). Of the gonocoxal synsclerite, the pointed anterior margin is reinforced by strong sclerotization (↓[3]) and the broadly U-shaped ventral emargination is only vaguely delineated basally. Larvae and females of *A. doczkali* sp. nov. are unknown.

DNA barcode

The CO1 sequence (652bp) of the holotype specimen is available in BIN BOLD:AER0700. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Etymology

The species is named to honor Dieter Doczkal, dipterologist at the Zoologische Staatssammlung München. The project GBOL III: Dark Taxa benefitted enormously from Dieter's talent as an exceptionally gifted collector of entomological specimens, including gall midges.

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′44″ N, 8°33′24″ E; elev.112 m; 26 Apr.–3 May 2020; D. Doczkal and K. Grabow leg.; Mala44

Other characters

Male

Body length. 2.3 mm.

Head. Eye bridge dorsally 8 ommatidia long. Scape and pedicel nearly concolorous with flagellum. 18 flagellomeres; neck of fourth flagellomere half as long as node (Fig. 8B). Palpus: only 3 segments retained, presumably 4-segmented and longer than head height.

Thorax. Metepisternal setae absent.

Wing. Slightly shorter than body. Length /width ratio 2.2.

Legs. Claws small, toothless. Empodia almost as long as claws.

Terminalia (Fig. 8A). Gonocoxal synsclerite broader than long; setulae on medial bridges with sockets only slightly enlarged; dorsoposterior portions only slightly protruding beyond ventroposterior portions. Gonostylus twice as long as high. Dorsal parameres (tegmen) subrectangular, slightly broader than long, margins sclerotized. Aedeagal apodeme about half as long as tegmen, moderately sclerotized, with arrow-shaped structure at apex indicating the junction of accessory gland ducts.

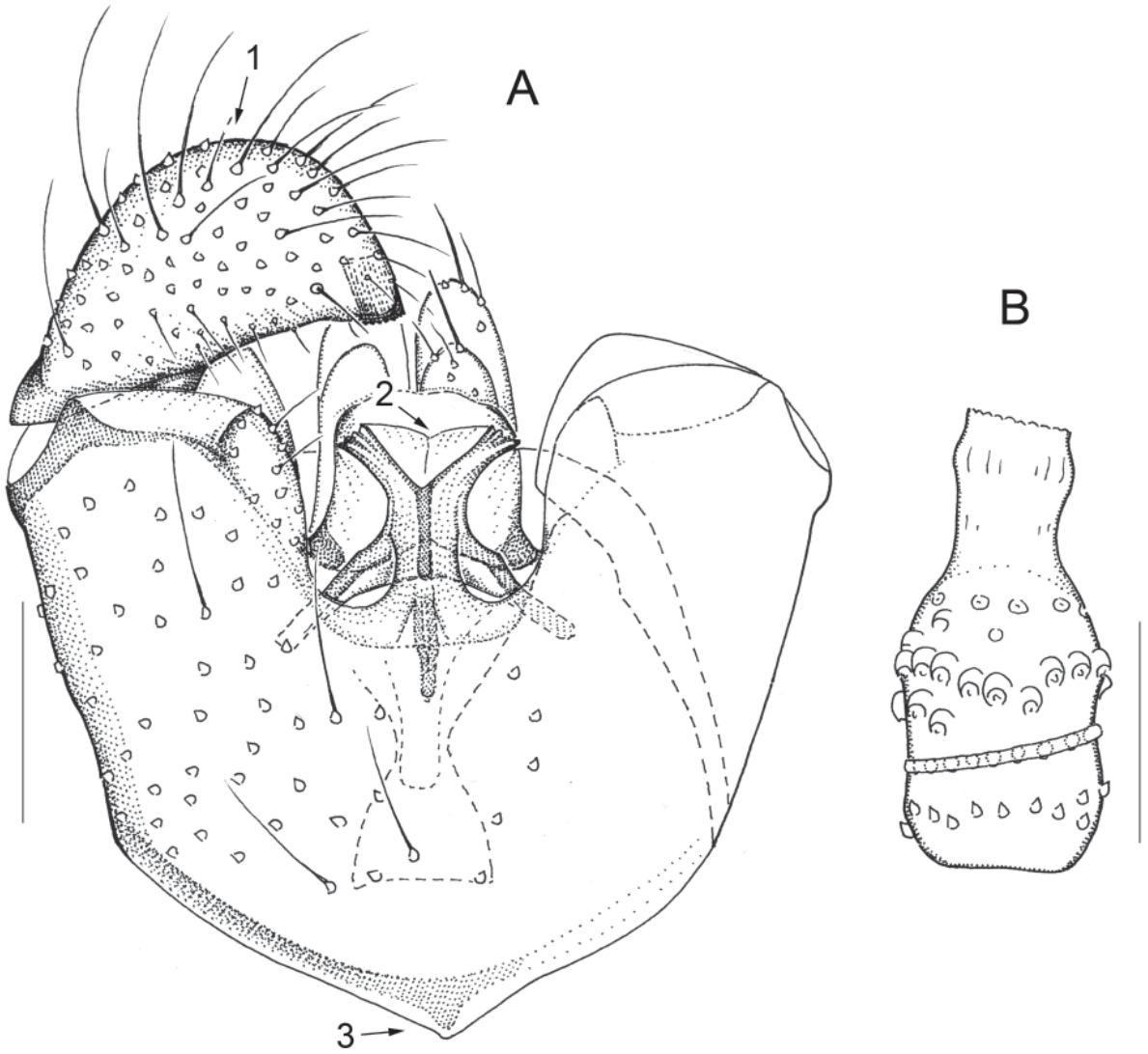

Fig. 8. *Asynapta doczkali* sp. nov., holotype, ♂ (ZSM-DIP-42304-E05). **A**. Terminalia, ventral view. **B**. Third flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Asynapta falcata sp. nov.
urn:lsid:zoobank.org:act:FB552245-A2D2-4D27-805B-0622FFC5DF1C
Fig. 9

Diagnosis

Morphology

Male terminalia characters to distinguish *Asynapta falcata* sp. nov. from congeners are as follows (Fig. 9A). The ovoid, setose gonocoxal processes of considerable size are almost completely surrounded by membranes, rendering them strangely separated from the sclerotized gonocoxal portions farther below (↓[1]). The gonocoxal ventral emargination resembles a small, sharply outlined U (↓[2]). The ventral parameres are sickle-shaped, with their apices slightly overlapping (↓[3]). Larvae and females of this new species are unknown.

DNA barcode

The CO1 sequence (652bp) of the paratype specimen listed below is available in BIN BOLD:AEX1610. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Etymology

The specific epithet, the Latin adjective for falciform, refers to the outline of the parameres characteristic of this species.

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′17″ N, 8°33′20″ E; elev. 114 m; 3–10 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of aspen trees; ZSM-DIP-42473-F08.

Paratypes

GERMANY • 1 ♂; same data as for the holotype but 48°91′20″ N, 8°33′22″ E; elev. 112 m; 26 Apr.–3 May 2020; ZSM-DIP-42478-E07 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8818-22; ZSM-DIP-42477-G06.

Other characters

Male

Body length. 2.3 mm.

Head. Eye bridge dorsally 9–10 ommatidia long. Scape and pedicel nearly concolorous with flagellum. 15–16 flagellomeres; neck of fourth flagellomere 0.9× as long as node (Fig. 9B). Palpus 4-segmented, longer than head height.

Thorax. Metepisternal setae absent.

Wing. Slightly shorter than body. Length /width ratio 2.5.

Legs. Claws with large tooth basally. Empodia almost as long as claws.

Terminalia (Fig. 9A). Gonocoxal synsclerite broader than long; ventral surface with large glabrous area around emargination, anterior margin pointed; medial bridges with numerous setae arising from large sockets; dorsoposterior portions subtriangular, protruding markedly beyond ventroposterior portions. Gonostylus nearly 3× as long as high, slightly bent, with pectinate tooth of moderate size.

Dorsal parameres (tegmen) subrectangular, slightly longer than broad, lateral margins reinforced by sclerotization. Aedeagal apodeme longer than parameres, moderately sclerotized, beyond the junction of the accessory gland ducts a large, partly sclerotized broadening.

Species comparison

The only other *Asynapta* in Europe with sickle-shaped parameres is *A. furcifer* Barnes, 1932, known from Italy and Cyprus (Gagné & Jaschhof 2021) as well as Israel (unpublished data). In specimens of *A. furcifer* I studied from Israel, the parameres are markedly longer compared with *A. falcata* sp. nov., and angled rather than evenly bent. Interestingly, *A. furcifer* has the same kind of isolated gonocoxal processes as found in *A. falcata*, making it even more likely that the two species are closely related. According to descriptions in the literature, *A. mira* Mamaev & Zaitzev, 1997 from Somalia and *A. northi* Spungis, 2006 from the Seychelles belong to the same kin (Mamaev & Zaitzev 1997; Spungis 2006a), along with an unnamed *Asynapta* I have seen from Israel. *Asynapta falcata* appears to be the northernmost representative of a species group with predominantly Mediterranean/Afrotropical distribution.

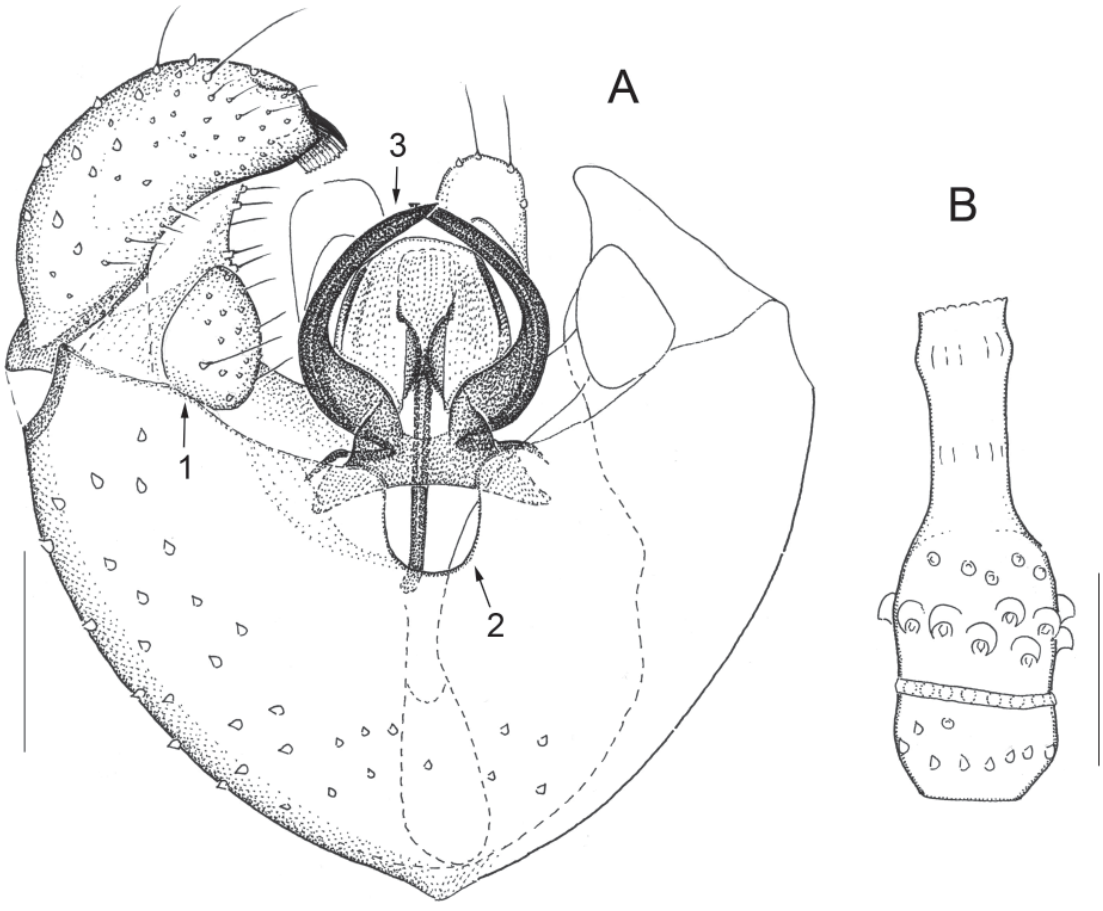

Fig. 9. *Asynapta falcata* sp. nov., holotype, ♂ (ZSM-DIP-42473-F08). **A**. Terminalia, ventral view. **B**. Third flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Asynapta inflatoides Jaschhof & Jaschhof, 2019

Morphological identification

Jaschhof & Jaschhof (2019b).

DNA barcode

CO1 sequences (641–653bp) of five specimens detailed below are available in BIN BOLD:AER0693. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; ZSM-DIP-42304-B05, • 1 ♂; same data as for preceding; BOLD GBDTA9993-21; ZSM-DIP-42304-B06 • 1 ♂; same data as for preceding; BOLD GBDTA9995-21; ZSM-DIP-42304-B08 • 1 ♂; same data as for preceding; BOLD GBDTA9996-21; ZSM-DIP-42304-B09 • 1 ♂; same data as for preceding; BOLD GBDTA10177-21; ZSM-DIP-42306-A12 • 1 ♂; same data as for preceding; BOLD GBDTA10178-21; ZSM-DIP-42306-B01.

Distribution

Germany (new record); Sweden, Finland, possibly Latvia and European part of Russia (Gagné & Jaschhof 2021).

Asynapta rufomaculata Panelius, 1965

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (645–653bp) of the five specimens listed below were allocated to three different BINs: BOLD:AER0698 (specimen ZSM-DIP-42306-E07), BOLD:AER0697 (ZSM-DIP-42306-A10), and BOLD:AER0699 (ZSM-DIP-42306-A07, ZSM-DIP-42306-A11, ZSM-DIP-42478-F04). Morphological differences in support of the genetic clustering were not found. Search on BOLD's BIN Database retrieved no further results for these BINs (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; BOLD GBDTA10172-21; ZSM-DIP-42306-A07 • 1 ♂; same data as for preceding; BOLD GBDTA10175-21; ZSM-DIP-42306-A10 • 1 ♂; same data as for preceding; BOLD GBDTA10176-21; ZSM-DIP-42306-A11 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′22″ E; elev. 112 m; 26 Apr.–3 May 2020; windthrow of aspen trees; BOLD DTIII8899-22; ZSM-DIP-42478-F04. – **Bavaria** • 1 ♂; Bamberg; 49°85′62″ N, 10°89′89″ E; elev. 282 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10220-21; ZSM-DIP-42306-E07.

Distribution

Germany new record); Sweden, Finland, Latvia (Gagné & Jaschhof 2021).

Genus ***Camptomyia*** Kieffer, 1894

Camptomyia, a further asynaptine genus of global distribution, had previously 73 species in the world, 31 in Europe, and three in Germany (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021a, 2021b, 2022, 2023). Males of about two thirds of the European species can be identified by use of the available literature (Jaschhof & Jaschhof 2013, 2019b, 2021a); recognition of the rest is problematic since their published descriptions, especially illustrations, lack accuracy and detail. Of the 14 species of *Camptomyia* addressed here, one is new to science and 13 are new additions to the German fauna. One of these taxa, *C. multinoda* (Felt, 1908), is a potential complex of species, which will require further study in a broader geographic scope to resolve. The taxonomy of the *C. corticalis* (Loew, 1851) group of species poses another unresolved problem of considerable complexity (Jaschhof & Jaschhof 2013, 2019b). The present project found six species of this group, each with a distinctive morphology, whose identity could not be resolved (labeled *C*. sp. MJDE1 to *C*. sp. MJDE6 in the list at the end of this paper). CO1 sequences were obtained of five of these species. Unexpectedly, even *C. corticalis* sensu Jaschhof & Jaschhof (2013), whose occurrence in Germany had been noted earlier (Jaschhof & Jaschhof 2021b), emerged here in three separate genetic clusters, representing the genuine *C. corticalis* (Jaschhof & Jaschhof 2013: figs 164a–d and 164f–h but not 164e) and two possibly unnamed species (*C*. sp. MJDE5 and *C*. sp. MJDE6). Pending a definite clarification of the issue, I regard *C. corticalis* as an aggregate species.

Camptomyia abnormis Mamaev, 1961

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652–664bp) of the three specimens listed below are available in BIN BOLD:ABW0442. Search on BOLD's BIN Database (accessed 26 Aug. 2023) retrieved a further eight matches for this BIN, all labeled *Camptomyia* sp. from Canada (four matches), Germany (two), and Norway (two).

Material examined

GERMANY– **Bavaria** • 1 ♂; Germaringen; 47°96′30″ N, 10°67′62″ E; elev. 650 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10032-21; ZSM-DIP-42304-E09 • 1 ♂; same data as for preceding; BOLD GBDTA10034-21; ZSM-DIP-42304-E11 • 1 ♂; Lower Franconia, Rhön, Oberelsbach, Leimertshecke; 50°44′64″ N, 10°01′69″ E; elev. 855 m; 27 Jun.–11 Jul. 2018; D. Doczkal leg.; Malaise trap; swampy clearing in beech forest; BOLD GBDTA10046-21; ZSM-DIP-42304-F11.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Camptomyia alstromi Jaschhof & Jaschhof, 2021

Morphological identification

Jaschhof & Jaschhof (2009, as *C. regia*; 2021a).

Material examined

GERMANY – **Bavaria** • 1 ♂; Dammbach, Dammbachtal; 49°86′64″ N, 9°32′63″ E; elev. 349 m; 3–17 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; nutrient-poor pasture with fruit trees; ZSM-DIP-

42471-D02 • 1 ♂; same data as for preceding; ZSM-DIP-42471-D03 • 1 ♂; same data as for preceding but 17 Jun.–2 Jul. 2021; ZSM-DIP-42472-C02 • 1 ♂; same data as for preceding; ZSM-DIP-42472-C03 • 1 ♂; same data as for preceding; ZSM-DIP-42472-C04.

Distribution

Germany (new record); Sweden, Finland (Jaschhof & Jaschhof 2021a).

Camptomyia calcarata Mamaev, 1964

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (640–652bp) of the five specimens listed below are available in BIN BOLD:AER0305. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 17–24 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8708-22; ZSM-DIP-42476-F03 • 1 ♂; same data as for preceding; BOLD DTIII8711-22; ZSM-DIP-42476-F06 • 1 ♂; same data as for preceding; BOLD DTIII8732-22; ZSM-DIP-42476-H03 • 1 ♂; same data as for preceding; BOLD DTIII8742-22; ZSM-DIP-42477-A02 • 1 ♂; same data as for preceding but 48°91′44″ N, 8°33′22″ E; 10–17 May 2020; windthrow of aspen trees; BOLD DTIII8845-22; ZSM-DIP-42478-A10.

Distribution

Germany (new record); widespread in northern Europe, also European part of Russia (Gagné & Jaschhof 2021).

Camptomyia drymophila Mamaev & Zaitzev, 1998

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652bp) of the two specimens listed below are available in BIN BOLD:AER0308. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′15″ N, 11°18′26″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA9922-21; ZSM-DIP-42303-D06 • 1 ♂; same data as for preceding; GBDTA9923-21; ZSM-DIP-42303-D07.

Distribution

Germany (new record); Sweden, Far East of Russia (Gagné & Jaschhof 2021).

Camptomyia erythromma Kieffer, 1888

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AER0307. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Moos, Isar estuary; 48°79′16″ N, 12°96′84″ E; elev. 312 m; 30 Jun.–13 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; softwood floodplain forest; BOLD GBDTA10308-21; ZSM-DIP-42307-D12.

Distribution

Germany (new record); France, Sweden (Gagné & Jaschhof 2021).

Camptomyia flavocinerea Panelius, 1965 agg.

Morphological identification

Jaschhof & Jaschhof (2013). Two *Camptomyia* males studied here, which undoubtedly are conspecific, match the illustrations of *C. flavocinerea* by Jaschhof & Jaschhof (2013: figs 167a and 167h). Nonetheless, as treatred there, *C. flavocinerea* is an aggregate of several distinct species whose taxonomy remains to be resolved.

DNA barcode

CO1 sequences (651–652bp) of the two specimens listed below are available in BIN BOLD:ADU3419. Search on BOLD 's BIN Database retrieved a further match for this BIN, as *Camptomyia flavocinerea* of unknown distribution (mined from GenBank) (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Munich, Botanical Garden; 48°16′46″ N, 11°49′49″ E; elev. 516 m; 21 Jun.–1 Jul. 2020; GBOL and R. Albrecht leg.; Malaise trap; BOLD GBDTA10309-21; ZSM-DIP-42307-E01 • 1 ♂; same data as for preceding; BOLD GBDTA10310-21; ZSM-DIP-42307-E02.

Distribution

Germany (new record); widespread in Europe; South Korea (Gagné & Jaschhof 2021).

Camptomyia gigantea Spungis, 1989

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Gaggenau-Michelbach, Michelbach; 48°49′14″ N, 8°23′17″ E; elev. 340 m; 23 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; floodplain forest; ZSM-DIP-42304-C04.

Distribution

Germany (new record); Sweden, Finland, Latvia, Slovak Republic (Gagné & Jaschhof 2021).

Camptomyia heterobia Mamaev, 1961
Fig. 10

A *Camptomyia* male studied here matches that of *C. heterobia* as illustrated by Spungis (1989: fig. 3.7), with the exception of the gonostylar apex that in the present specimen is pointed (Fig. 10A) rather than narrowly rounded. What seems to be a difference in shape is most likely just a matter of how the gonostylus is oriented in the slide mount. Also, in Spungis's illustration the ventral parameres diverge to form a V-shape, while they are parallel to each other in the specimen studied here (Fig. 10B); this difference I deem an indication of these structures' mobility. The few published records of *C. heterobia* suggest this species to be widespread in the Palearctic, albeit rarely encountered in nature.

Revised diagnosis

Morphology

Camptomyia heterobia is characterized by the construction of the parameres, of which the dorsal pair is long and thick, with the apices bent laterad (↓[1], Fig. 10B), whereas the much smaller ventral pair forms two pointed rods laterally attached to the aedeagal apodeme (↓[2], Fig. 10B). Males are large, the body length being 3.3 mm in the German specimen and 4.1 mm in the Russian specimens described by Mamaev (1961), and the posterior fork (M_4+CuA) is unusually distinct (Mamaev 1961: fig. 1.1, veins in question labeled Cu_1 and Cu_2).

DNA barcode

The CO1 sequence (653bp) of the specimen listed below is available in BIN BOLD:AER0298. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

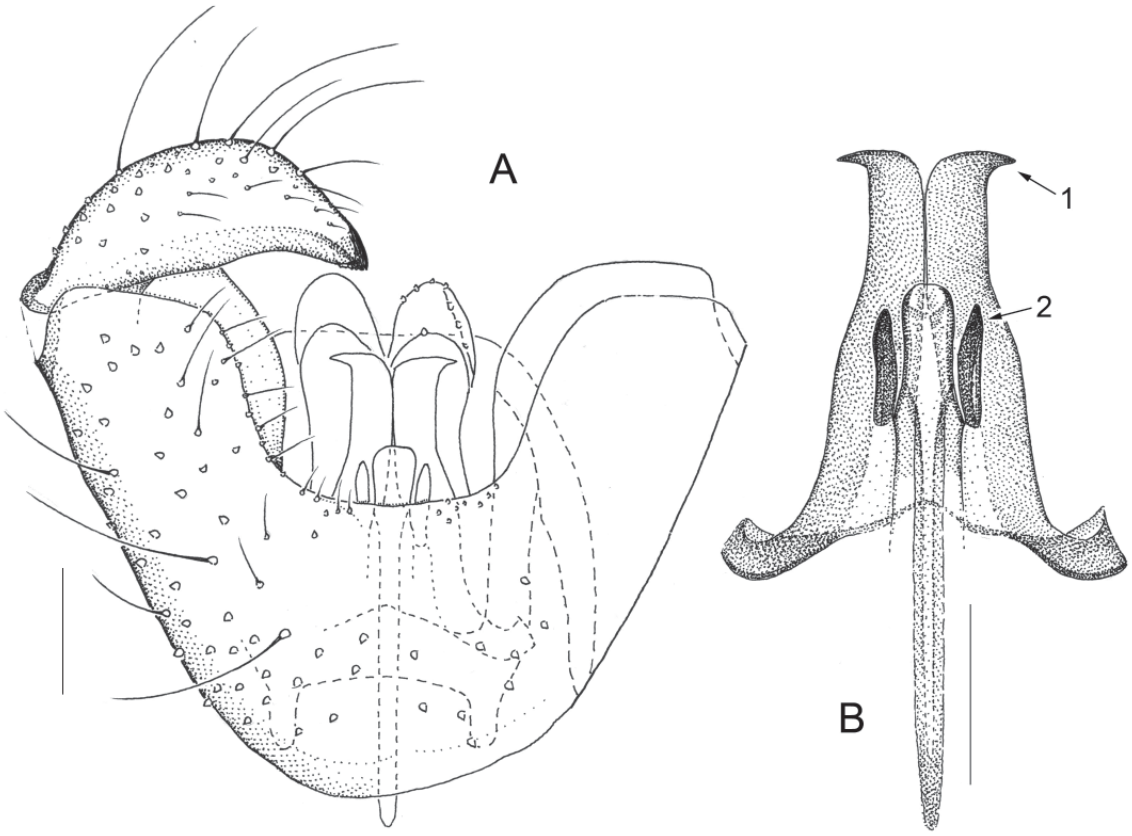

Fig. 10. *Camptomyia heterobia* Mamaev, 1961, ♂ (ZSM-DIP-42303-F08). **A**. Terminalia, ventral view. **B**. Parameres and aedeagal apodeme, ventral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′88″ N, 11°18′44″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA9948-21; ZSM-DIP-42303-F08.

Distribution

Germany (new record); Latvia, European part of Russia, South Korea (Gagné & Jaschhof 2021).

Camptomyia multinoda (Felt, 1908) agg.

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (651–696bp) of the 73 specimens listed below were assigned to five different BINs, namely BOLD:AEW6793 (one specimen), BOLD:AER0301 (eight), BOLD:AEY2389 (one), BOLD:AEY8233 (five), and BOLD:ACU9836 (58). Search on BOLD's BIN Database retrieved a further match for BOLD:ACU9836, as Cecidomyiidae sp. from Canada (accessed 26 Aug. 2023). The occurrence of this BIN in North America might indicate that this is the genuine *C. multinoda*, a species originally described from Illinois, USA (Felt 1908). A further match was also retrieved for BOLD:AEW6793, as Cecidomyiidae sp. from Norway (accessed 26 Aug. 2023). My reexamination of the DNA barcoded specimens from Germany revealed slight morphological distinctions in support of the genetic clustering found here, which concern the gonostylus, the parameres, and the ninth tergite. However, individual variation, which no doubt occurs in these structures too, were found to blur inter-cluster distinctions. Also, there is the disturbing fact that the specimens assigned here to five different clusters come from the same site. One wonders what picture of genetic variation DNA barcoding would draw once multiple samples of morphotypical *C. multinoda* from different parts of the vast distribution area were subjected to analysis. For the time being I consider *C. multinoda* an aggregate species in need of further research.

Material examined

BOLD:AEW6793

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8800-22; ZSM-DIP-42477-E12.

BOLD:AER0301

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′28″ N, 8°33′35″ E; elev. 111 m; 26 Apr.–3 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow scrub and reed; BOLD DTIII8678-22; ZSM-DIP-42476-C09 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 12–26 Apr. 2020; windthrow of willow and aspen trees; BOLD DTIII8775-22; ZSM-DIP-42477-C11 • 1 ♂; same data as for preceding but 17–24 May 2020; BOLD DTIII8712-22; ZSM-DIP-42476-F07 • 1 ♂; same data as for preceding; BOLD DTIII8724-22; ZSM-DIP-42477-A01 • 1 ♂; same data as for preceding; BOLD DTIII8741-22; ZSM-DIP-42476-G07 • 1 ♂; same data as for preceding; BOLD DTIII8748-22; ZSM-DIP-42477-A08 • 1 ♂; same data as for preceding but 48°91′44″ N, 8°33′22″ E; 10–17 May 2020; windthrow of aspen trees; BOLD DTIII8829-22; ZSM-DIP-42477-H05 • 1 ♂; same data as for preceding; BOLD DTIII8836-22; ZSM-DIP-42478-A01.

BOLD:AEY2389
GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′28″ N, 8°33′35″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow scrub and reed; BOLD DTIII8603-22; ZSM-DIP-42475-E05.

BOLD:AEY8233
GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′28″ N, 8°33′35″ E; elev. 111 m; 17–24 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow scrub and reed; BOLD DTIII8546-22; ZSM-DIP-42474-H07 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 29 Mar.–12 Apr. 2020; windthrow of willow and aspen trees; ZSM-DIP-42477-C05 • 1 ♂; same data as for preceding but 12–26 Apr. 2020; BOLD DTIII8790-22; ZSM-DIP-42477-E02 • 1 ♂; same data as for preceding but 26 Apr.–3 May 2020; BOLD DTIII8651-22; ZSM-DIP-42476-A06 • 1 ♂; same data as for preceding; BOLD DTIII8664-22; ZSM-DIP-42476-B07.

BOLD:ACU9836
GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA9977-21; ZSM-DIP-42304-A02 • 1 ♂; same data as for preceding but 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; windthrow of birch trees; BOLD GBDTA9990-21; ZSM-DIP-42304-B03 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8873-22; ZSM-DIP-42478-D02 • 1 ♂; same data as for preceding but 48°91′44″ N, 8°33′24″ E; elev. 112 m; 3–10 May 2020; willow/aspen forest and game browsing field; BOLD GBDTA10142-21; ZSM-DIP-42305-F12 • 1 ♂; same data as for preceding but 48°91′28″ N, 8°33′35″ E; elev. 111 m; 12–26 Apr. 2020; willow scrub and reed; BOLD DTIII8592-22; ZSM-DIP-42475-D06 • 1 ♂; same data as for preceding but 17–24 May 2020; BOLD DTIII8535-22; ZSM-DIP-42474-G08 • 1 ♂; same data as for preceding; BOLD DTIII8551-22; ZSM-DIP-42475-A01 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 12–26 Apr. 2020; windthrow of willow and aspen trees; BOLD DTIII8772; ZSM-DIP-42477-C08 • 1 ♂; same data as for preceding; BOLD DTIII8773; ZSM-DIP-42477-C09 • 1 ♂; same data as for preceding; BOLD DTIII8774-22; ZSM-DIP-42477-C10 • 1 ♂; same data as for preceding; BOLD DTIII8787-22; ZSM-DIP-42477-D11 • 1 ♂; same data as for preceding; BOLD DTIII8795-22; ZSM-DIP-42477-E07 • 1 ♂; same data as for preceding but 26 Apr.–3 May 2020; BOLD DTI8629-22; ZSM-DIP-42475-G07 • 1 ♂; same data as for preceding; BOLD DTI8631-22; ZSM-DIP-42475-G09 • 1 ♂; same data as for preceding; BOLD DTI8633-22; ZSM-DIP-42475-G11 • 1 ♂; same data as for preceding; BOLD DTI8635-22; ZSM-DIP-42475-H01 • 1 ♂; same data as for preceding; BOLD DTI8641-22; ZSM-DIP-42475-H07 • 1 ♂; same data as for preceding; BOLD DTIII8646-22; ZSM-DIP-42476-A01 • 1 ♂; same data as for preceding; BOLD DTIII8647-22; ZSM-DIP-42476-A02 • 1 ♂; same data as for preceding; BOLD DTIII8648-22; ZSM-DIP-42476-A03 • 1 ♂; same data as for preceding; BOLD DTIII8650-22; ZSM-DIP-42476-A05 • 1 ♂; same data as for preceding; BOLD DTIII8652-22; ZSM-DIP-42476-A07 • 1 ♂; same data as for preceding; BOLD DTIII8654-22; ZSM-DIP-42476-A09 • 1 ♂; same data as for preceding; BOLD DTIII8655-22; ZSM-DIP-42476-A10 • 1 ♂; same data as for preceding; BOLD DTIII8657-22; ZSM-DIP-42476-A12 • 1 ♂; same data as for preceding; BOLD DTIII8659-22; ZSM-DIP-42476-B02 • 1 ♂; same data as for preceding; BOLD DTIII8660-22; ZSM-DIP-42476-B03 • 1 ♂; same data as for preceding but 26 Apr.–3 May 2020; BOLD DTIII8702-22; ZSM-DIP-42476-E09 • 1 ♂; same data as for preceding; BOLD DTIII8703-22; ZSM-DIP-42476-E10 • 1 ♂; same data as for preceding; BOLD DTIII8706-22; ZSM-DIP-42476-F01 • 1 ♂; same data as for preceding; BOLD DTIII8713-22; ZSM-DIP-42476-F08 • 1 ♂; same data as for preceding; BOLD DTIII8715-22; ZSM-DIP-42476-F10 • 1 ♂; same data as for preceding; BOLD DTIII8718-22; ZSM-DIP-42476-G01 • 1 ♂; same data as for preceding; BOLD DTIII8719-22; ZSM-DIP-42476-G02 • 1 ♂; same data as for preceding; BOLD DTIII8720; ZSM-DIP-42476-G03 • 1 ♂; same data as for preceding; BOLD DTIII8721-22; ZSM-DIP-42476-G04 • 1 ♂; same data as for preceding; BOLD DTIII8723-22; ZSM-DIP-42476-G06 • 1 ♂; same data as for preceding; BOLD DTIII8726-22; ZSM-DIP-42476-G09 • 1 ♂; same data as for preceding;

BOLD DTIII8728-22; ZSM-DIP-42476-G11 • 1 ♂; same data as for preceding; BOLD DTIII8730-22; ZSM-DIP-42476-H01 •1 ♂; same data as for preceding; BOLD DTIII8733-22; ZSM-DIP-42476-H04 • 1 ♂; same data as for preceding; BOLD DTIII8735-22; ZSM-DIP-42476-H06 • 1 ♂; same data as for preceding; BOLD DTIII8743-22; ZSM-DIP-42477-A03 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8855-22; ZSM-DIP-42478-B08 • 1 ♂; same data as for preceding; BOLD DTIII8856-22; ZSM-DIP-42478-B09 • 1 ♂; same data as for preceding; BOLD DTIII8858-22; ZSM-DIP-42478-B11 • 1 ♂; same data as for preceding; BOLD DTIII8859-22; ZSM-DIP-42478-B12 • 1 ♂; same data as for preceding; BOLD DTIII8862-22; ZSM-DIP-42478-C03 • 1 ♂; same data as for preceding; BOLD DTIII8864-22; ZSM-DIP-42478-C05 • 1 ♂; same data as for preceding; BOLD DTIII8865-22; ZSM-DIP-42478-C06 • 1 ♂; same data as for preceding; BOLD DTIII8868-22; ZSM-DIP-42478-C09 • 1 ♂; same data as for preceding but 48°91′24″ N, 8°33′51″ E; elev. 118 m; 10–17 May 2020; windthrow of beech trees; BOLD DTIII8763-22; ZSM-DIP-42477-B11 • 1 ♂, same data as for preceding but 48°91′20″ N, 8°33′22″ E; elev. 112 m; 26 Apr.–3 May 2020; windthrow of aspen trees; BOLD DTIII8897-22; ZSM-DIP-42478-F02 • 1 ♂; same data as for preceding; BOLD DTIII8913-22; ZSM-DIP-42478-G06 • 1 ♂; same data as for preceding; BOLD DTIII8915-22; ZSM-DIP-42478-G08 • 1 ♂; same data as for preceding; BOLD DTIII8919-22; ZSM-DIP-42478-G12 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8835-22; ZSM-DIP-42477-H11°

Distribution

Germany (new record); widespread in Palearctic, USA (Gagné & Jaschhof 2021).

Camptomyia oldhammeri Jaschhof & Jaschhof, 2019

Morphological identification

Jaschhof & Jaschhof (2019b).

DNA barcode

The CO1 sequence (653bp) of the specimen listed below is available in BIN BOLD:AER0300. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA9940-21; ZSM-DIP-42303-E12.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Camptomyia salicicola Mamaev, 1961

Morphological identification

Jaschhof & Jaschhof (2013). The present study identified a species close to, but distinct from *C. salicicola*, whose morphology resembles the Nearctic *C. antennata* Felt, 1920 as described by Parnell (1971). Credible records of *C. antennata* outside North America are unknown. The possibly new species is labeled *Camptomyia* sp. MJDE7 in the list at the end of this paper.

DNA barcode

CO1 sequences (640–653bp) of the 41 specimens listed below are available in BIN BOLD:AER0302. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; BOLD GBDTA9988-21; ZSM-DIP-42305-H11 • 1 ♂; same data as for preceding; BOLD GBDTA9989-21; ZSM-DIP-42304-B02 • 1 ♂; same data as for preceding; BOLD GBDTA10165-21; ZSM-DIP-42304-B01 • 1 ♂; same data as for preceding; BOLD GBDTA10166-21; ZSM-DIP-42306-A01 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8870-22; ZSM-DIP-42478-C11 • 1 ♂; same data as for preceding; BOLD DTIII8875-22; ZSM-DIP-42478-D04 • 1 ♂; same data as for preceding but 48°91′28″ N, 8°33′35″ E; elev. 111 m; 12–26 Apr. 2020; willow scrub and reed; BOLD DTIII8594-22; ZSM-DIP-42475-D08 • 1 ♂; same data as for preceding; BOLD DTIII8598-22; ZSM-DIP-42475-D12 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 12–26 Apr. 2020; windthrow of willow and aspen trees; BOLD DTIII8771-22; ZSM-DIP-42477-C07 • 1 ♂; same data as for preceding; BOLD DTIII8776-22; ZSM-DIP-42477-C12 • 1 ♂; same data as for preceding; BOLD DTIII8778-22; ZSM-DIP-42477-D02 • 1 ♂; same data as for preceding; BOLD DTIII8780-22; ZSM-DIP-42477-D04 • 1 ♂; same data as for preceding; BOLD DTIII8782-22; ZSM-DIP-42477-D06 • 1 ♂; same data as for preceding; BOLD DTIII8784-22; ZSM-DIP-42477-D08 • 1 ♂; same data as for preceding; BOLD DTIII8785-22; ZSM-DIP-42477-D09 • 1 ♂; same data as for preceding; BOLD DTIII8791-22; ZSM-DIP-42477-E03 • 1 ♂; same data as for preceding; BOLD DTIII8794-22; ZSM-DIP-42477-E06 • 1 ♂; same data as for preceding; BOLD DTIII8797-22; ZSM-DIP-42477-E09 • 1 ♂; same data as for preceding; BOLD DTIII8798-22; ZSM-DIP-42477-E10 • 1 ♂; same data as for preceding but 26 Apr.–3 May 2020; BOLD DTIII8630-22; ZSM-DIP-42475-G08 • 1 ♂; same data as for preceding; BOLD DTIII8637-22; ZSM-DIP-42475-H03 • 1 ♂; same data as for preceding; BOLD DTIII8643-22; ZSM-DIP-42475-H09 • 1 ♂; same data as for preceding; BOLD DTIII8649-22; ZSM-DIP-42476-A04 • 1 ♂; same data as for preceding; BOLD DTIII8662-22; ZSM-DIP-42476-B05 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8854-22; ZSM-DIP-42478-B07 • 1 ♂; same data as for preceding but 17–24 May 2020; BOLD DTIII8729-22; ZSM-DIP-42476-G12 • 1 ♂; same data as for preceding; BOLD DTIII8737-22; ZSM-DIP-42476-H08 • 1 ♂; same data as for preceding; BOLD DTIII8744-22; ZSM-DIP-42477-A04 • 1 ♂; same data as for preceding; BOLD DTIII8747-22; ZSM-DIP-42477-A07 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′22″ E; elev. 112 m; 26 Apr.–3 May 2020; windthrow of aspen trees; BOLD DTIII8687-22; ZSM-DIP-42476-D06 • 1 ♂; same data as for preceding; BOLD DTIII8688-22; ZSM-DIP-42476-D07 • 1 ♂; same data as for preceding; BOLD DTIII8694-22; ZSM-DIP-42476-E01 • 1 ♂; same data as for preceding; BOLD DTIII8898-22; ZSM-DIP-42478-F03 • 1 ♂; same data as for preceding; BOLD DTIII8903-22; ZSM-DIP-42478-F08 • 1 ♂; same data as for preceding; BOLD DTIII8911-22; ZSM-DIP-42478-G04 • 1 ♂; same data as for preceding; BOLD DTIII8917-22; ZSM-DIP-42478-G10 • 1 ♂; same data as for preceding; BOLD DTIII8918-22; ZSM-DIP-42478-G11 • 1 ♂; same data as for preceding but 10–17 May 2020; BOLD DTIII8827-22; ZSM-DIP-42477-H03 • 1 ♂; same data as for preceding; BOLD DTIII8831-22; ZSM-DIP-42477-H07 • 1 ♂; same data as for preceding; BOLD DTIII8833-22; ZSM-DIP-42477-H09 • 1 ♂; same data as for preceding but 48°91′24″ N, 8°33′51″ E; elev. 118 m; 10–17 May 2020; windthrow of beech trees; BOLD DTIII8766-22; ZSM-DIP-42477-C02.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Camptomyia serrata sp. nov.
urn:lsid:zoobank.org:act:49E7C5C5-E1E6-4623-B08F-274029B6BCB2
Fig. 11

Diagnosis

Camptomyia serrata sp. nov. differs from congeneric species in the male terminalia structures, notably the dorsal parameres whose margins are serrate apicolaterally due to the presence of 5–6 small barbs (↓[1], Fig. 11E). A further peculiarity is the ninth tergite whose posterior margin is indented in an unmistakable manner, and whose cordate central portion, which is darkly pigmented and sparsely setose, has a sclerotized median axis ending in an inverse T-shape (↓[2], Fig. 11C). Larvae and females of the new species are unknown.

Etymology

The specific epithet, the Latin adjective for 'serrate', refers to the peculiar outline of the parameres.

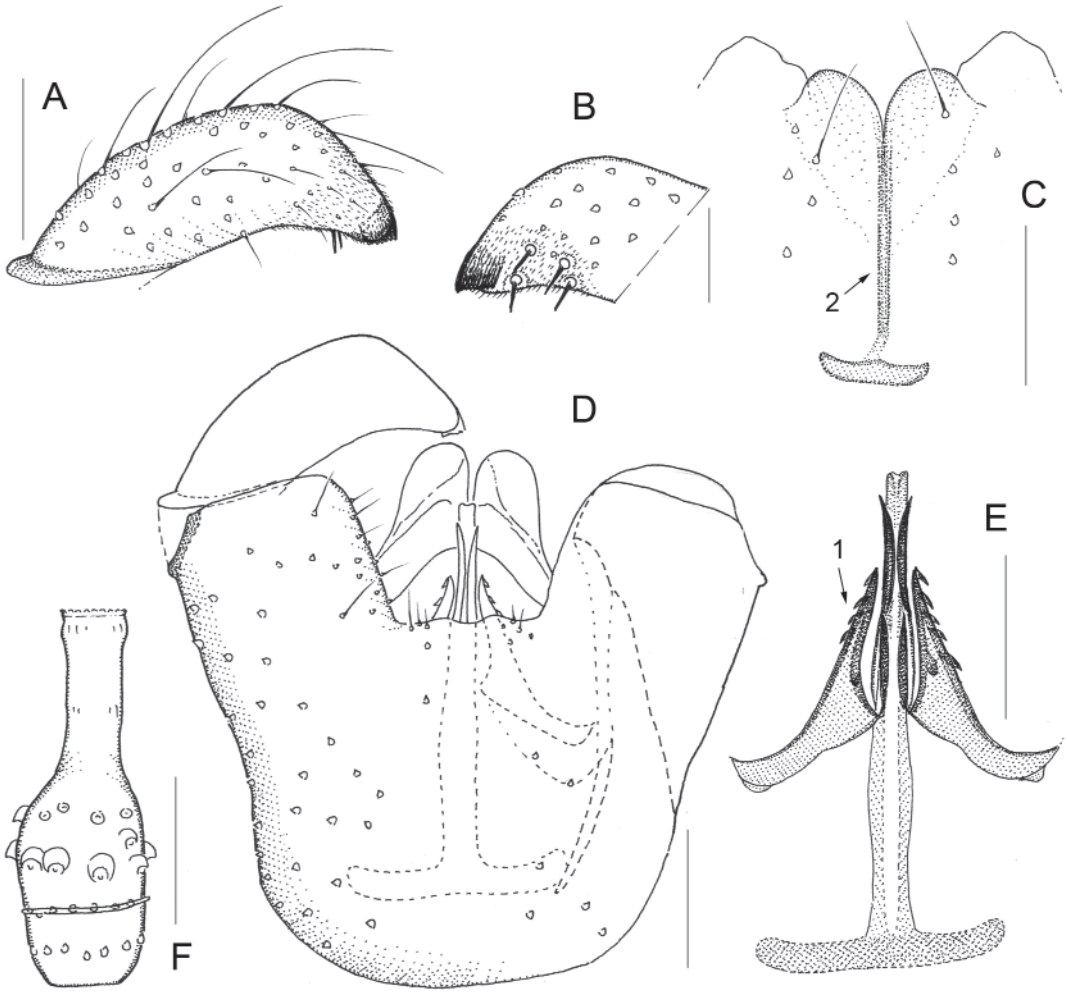

Fig. 11. *Camptomyia serrata* sp. nov., holotype, ♂ (ZSM-DIP-42304-C09). **A**. Gonostylus, ventral view. **B**. Gonostylar apex, dorsal view. **C**. Ninth tergite, dorsal view. **D**. Terminalia, ventral view. **E**. Parameres and aedeagal apodeme, ventral view. **F**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Gaggenau-Michelbach, Katzenbusch; 48°48′40″ N, 8°22′32″ E; elev. 348 m; 24 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; *Quercus petraea* forest; ZSM-DIP-42304-C09.

Other characters

Male

Body length. 2.3 mm.

Head. Eye bridge dorsally 8 ommatidia long. Scape and pedicel brighter than flagellum. Length of flagellum unknown, only 4 flagellomeres retained; neck of fourth flagellomere 0.9× as long as node (Fig. 11F). Palpus 4-segmented, longer than head height.

Wing. As long as body. Length/width ratio 2.6.

Terminalia. Gonocoxal synsclerite slightly broader than long; ventral setae unusually small and sparse medially, larger and normally dense laterally; ventral emargination small, subtrapezoid, its basal margin membranous, sinuous, with fine setulae in two separate clusters; dorsoposterior portions only slightly protruding beyond ventroposterior portions; dorsal apodemes long and thin (Fig. 11D). Gonostylus slender, 3× as long as high, on apical third slightly curved, pointed; apex with conspicuously dense microtrichia (causing darker coloration), sparse, with fine setulae, 4 short subapical bristles dorsally, and moderately large pectinate tooth (Fig. 11A–B). Ventral parameres present as a pair of small, slightly bent, pointed appendages situated in apical third of aedeagal apodeme. Aedeagal apodeme twice as long as posterior parameres; its apex protrudes slightly beyond ventral parameres; basal half portion weakly sclerotized, conversely T-shaped; point of junction with accessory gland ducts marked by a pair of parallel, elongate sclerotizations whose appearance is similar to that of the ventral parameres (Fig. 11E).

Camptomyia spinifera Mamaev, 1961

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (648–677bp) of the five specimens listed below are available in BIN BOLD:AER0293. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Gaggenau-Michelbach, Michelbach; 48°49′14″ N, 8°23′17″ E; elev. 340 m; 23 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; floodplain forest; BOLD GBDTA10002-21; ZSM-DIP-42304-C03 • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′22″ E; elev. 112 m; 10–17 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of aspen trees; BOLD DTIII8830-22; ZSM-DIP-42477-H06. – **Bavaria** • 1 ♂; Germaringen; 47°96′30″ N, 10°67′62″ E; elev. 650 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10033-21; ZSM-DIP-42304-E10 • 1 ♂; same data as for preceding; BOLD GBDTA10036-21; ZSM-DIP-42304-F01 • 1 ♂; same data as for preceding; BOLD GBDTA10038-21; ZSM-DIP-42304-F03.

Distribution

Germany (new record); widespread in Palearctic (Gagné & Jaschhof 2021).

Camptomyia ulmicola Mamaev, 1961

Morphological identification

Jaschhof & Jaschhof (2019b).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg; Malaise trap; south-facing hill slope; ZSM-DIP-42304-A01. – **Bavaria** • 1 ♂; Germaringen; 47°96′30″ N, 10°67′62″ E; elev. 650 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42304-F02 • 1 ♂; Bamberg; 49°85′62″ N, 10°89′89″ E; elev. 282 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-E08.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Genus ***Colomyia*** Kieffer, 1892

Colomyia is a small genus of four species in Europe, one in New Zealand, and possibly one in Indonesia (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2013, 2022). The German fauna comprises three species of *Colomyia*, including a first-time record documented here.

Colomyia caudata Spungis, 1991

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 10–17 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; ZSM-DIP-42478-C07.

Distribution

Germany (new record); Sweden, Latvia (Gagné & Jaschhof 2021).

Genus ***Parasynapta*** Panelius, 1965

This genus contains two possibly identical species (Jaschhof & Jaschhof 2013), the Nearctic *P. canadensis* (Felt, 1908) and the Palearctic *P. intermedia* Panelius, 1965. The first-time German record of *P. intermedia* detailed below extends the Palearctic range of *Parasynapta* from northern Europe to the central parts of the continent.

Parasynapta intermedia Panelius, 1965

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AEI5239. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA9902-21; ZSM-DIP-42303-B10.

Distribution

Germany (new record); Sweden, Finland, Latvia (Gagné & Jaschhof 2021).

Genus ***Svenartia*** Jaschhof, 2009

This monotypic genus is shown here for the first time to occur in Germany. The single species classified in *Svenartia* was previously known only from a very few localities in southern Sweden (Jaschhof & Jaschhof 2021a).

Svenartia spungisi Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AEZ3380. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8796-22; ZSM-DIP-42477-E08.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Tribe **Dicerurini** Mamaev, 1966

Of 13 genera of Dicerurini known from Europe, only *Dicerura* Kieffer, 1898 and *Glemparon* Jaschhof, 2013 were previously reported as occurring in Germany (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021b). New additions to the German fauna communicated here are *Arctepidosis* Mamaev, 1990, *Desertepidosis* Mamaev & Soyunov, 1989, *Neurepidosis* Spungis, 1987, and *Paratetraneuromyia* Spungis, 1987. Noteworthy for its absence in Germany is *Tetraneuromyia* Mamaev, 1964. Considering that 12 species of this genus occur in Sweden, and three in the Czech and Slovak Republics (Sikora *et al.* 2017; Jaschhof & Jaschhof 2021a), one may assume that finding *Tetraneuromyia* in Germany is merely a matter of time. The Dicerurini of northern Europe were recently reviewed by Jaschhof & Jaschhof (2019a).

Genus ***Arctepidosis*** Mamaev, 1990

Jaschhof & Jaschhof (2017) considered that the two species known of this genus, *Arctepidosis jamalensis* Mamaev, 1990 and *A. paneliusi* Mamaev & Zaitzev, 1998, might be identical. *Arctepidosis paneliusi* is a poorly known species, whose distinctness needs to be validated by fresh material. *Arctepidosis* midges, which are rarely encountered in nature, are reported here for the first time as occurring in Germany.

Arctepidosis jamalensis Mamaev, 1990

Morphological identification

Jaschhof & Jaschhof (2017).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42303-H02 • 1 ♂; same data as for preceding but 48°91′28″ N, 8°33′35″ E; elev. 111 m; 12–26 Apr. 2020; willow scrub and reed; ZSM-DIP-42475-E02 • 1 ♂; same data as for preceding but 17–24 May 2020; ZSM-DIP-42474-H05.

Distribution

Germany (new record); Sweden, western Siberian part of Russia (Gagné & Jaschhof 2021).

Genus ***Desertepidosis*** Mamaev & Soyunov, 1989

A further new addition to the German fauna, this genus was recently redefined and shown to comprise six species in the Palearctic region (Jaschhof & Jaschhof 2019a).

Desertepidosis borealis Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013, 2019a).

DNA barcode

The CO1 sequence (651bp) of the specimen listed below is available in BIN BOLD:AER2248. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Rimpar; 49°85′93″ N, 9°95′34″ E; elev. 279 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42310-B10.

Distribution

Germany (new record); Sweden, Latvia, Czech Republic (Gagné & Jaschhof 2021).

Genus ***Dicerura*** Kieffer, 1898

Dicerura, the largest genus of the tribe Dicerurini, contains 32 species in the Holarctic region and 19 in Europe (Gagné & Jaschhof 2021). Males of the European species can be identified using the morphological descripions published by Jaschhof & Jaschhof (2013) and Jaschhof & Spungis (2018).

In Germany, the genus was previously known from a single species (Jaschhof & Jaschhof 2021b); the discovery of a second *Dicerura* is detailed here.

Dicerura scirpicola Kieffer, 1898
Fig. 12

Dicerura scirpicola, the type species of the genus *Dicerura*, was discovered more than 120 years ago in France (Kieffer 1898). Kieffer's syntypes are lost and the species had not been recognized since, so our understanding of it was previously limited to information provided in the original description. With the find of a single male in a Malaise trap sample from Bavaria, *D. scirpicola* may now be regarded as rediscovered. Its identification was made possible by Kieffer's illustration of the male terminalia (Kieffer 1899: fig. 2), which shows two structures diagnostic of this species: the large, characteristically shaped gonostylus and the large, furcate apex of the aedeagal apodeme.

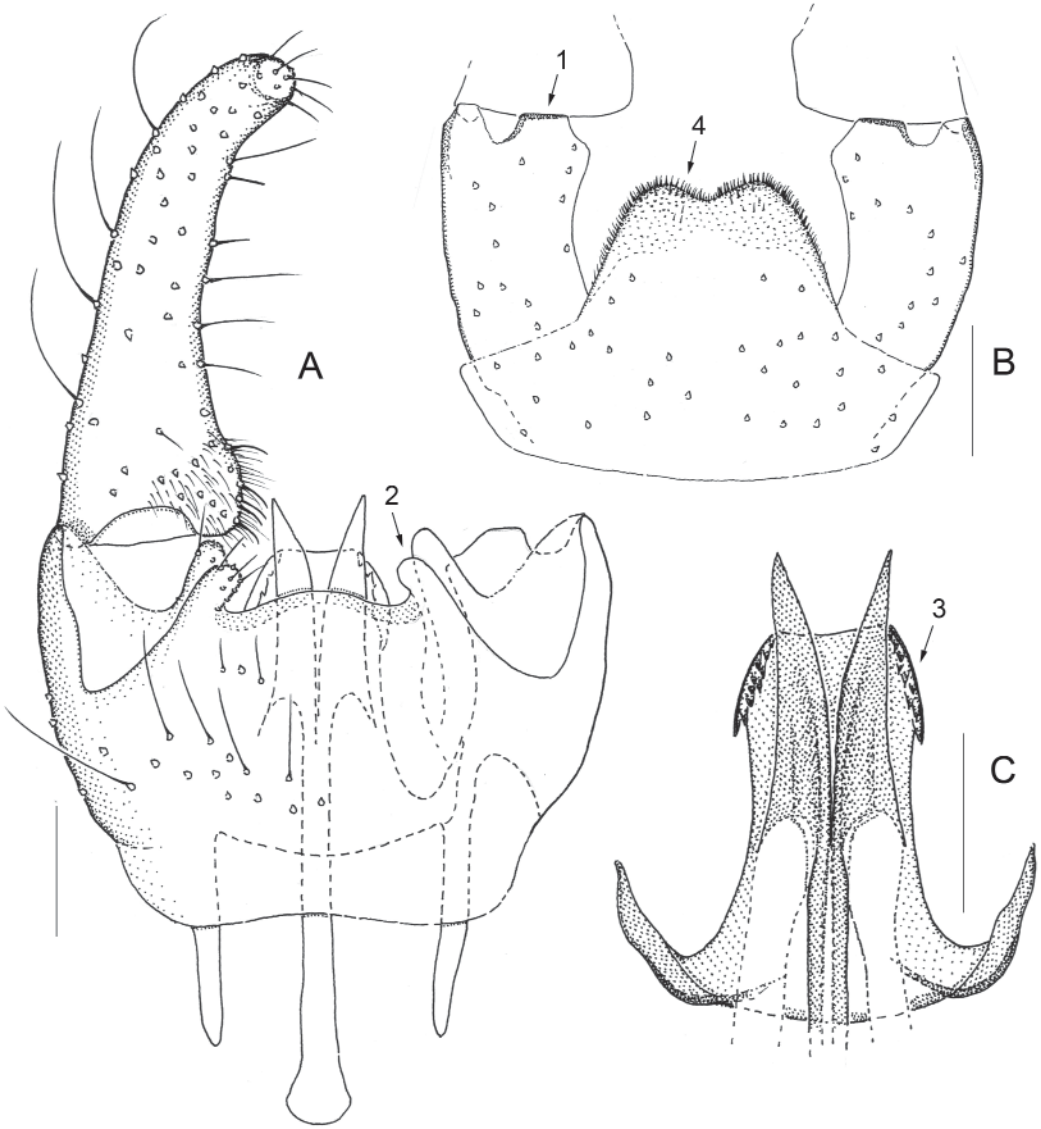

Fig. 12. *Dicerura scirpicola* Kieffer, 1898, ♂ (ZSM-DIP-42305-D12). **A**. Terminalia, ventral view. **B**. Gonocoxae and ninth tergite, dorsal view. **C**. Parameres and apex of aedeagal apodeme, ventral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Revised diagnosis

Morphology

The unusually long gonostylus is slightly bent, tapered towards the apex, and slightly bulged basally, which together makes for an unmistakable outline (Fig. 12A). The linkage between gonostylus and gonocoxa is peculiar for its two joints, the usual one laterally and an additional one dorsally (↓[1], Fig. 12B). The gonocoxal synsclerite has two pairs of setose processes on either side of the ventral emargination (↓[2], Fig. 12A); the aedeagal apodeme ends in a furca of considerable size (Fig. C); the tegmen, whose lateral and posterior margins are concave, has clusters of barb-like knobs apicolaterally (↓[3], Fig. 12C); and the bilobed posterior portion of the ninth tergite is covered in dense, large microtrichia (↓[4], Fig. 12B).

DNA barcode

The CO1 sequence (651bp) of the specimen listed below is available in BIN BOLD:AEI1289. Search on BOLD's BIN Database retrieved a further six matches for this BIN, as Cecidomyiidae sp. from Norway (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhr, Postlohe, Sattelbogenweiher; 49°26′86″ N, 12°37′88″ E; elev. 382 m; 25 Jun.–13 Jul. 2016; D. Doczkal and J. Voith leg.; Malaise trap; pond edge; BOLD GBDTA10118-21; ZSM-DIP-42305-D12.

Distribution

Germany (new record); France (Gagné & Jaschhof 2021).

Genus ***Neurepidosis*** Spungis, 1987

This genus of previously 14 species in the Holarctic region and 10 in Europe (Gagné & Jaschhof 2021) is shown here for the first time to occur in Germany. Of a total of seven species identified here, two are new to science. The taxonomy of *Neurepidosis* was most recently reviewed by Jaschhof & Jaschhof (2013, 2019a).

Neurepidosis conchata Fedotova & Sidorenko, 2008

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (642–652bp) of the three specimens listed below are available in BIN BOLD:AAV5570. Search on BOLD's BIN Database retrieved 30 matches for this BIN, all as Cecidomyiidae sp. from Canada (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′44″ N, 8°33′24″ E; elev. 112 m; 3–10 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow/aspen forest and game browsing field; BOLD GBDTA10139-21; ZSM-DIP-42305-F09 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 17–24 May 2020; windthrow of willow and aspen trees; BOLD DTIII8704-22; ZSM-DIP-42478-E11 • 1 ♂; same data as for preceding; BOLD DTIII8740-22; ZSM-DIP-42478-H11.

Distribution

Germany (new record); Sweden, Far East of Russia (Gagné & Jaschhof 2021).

Neurepidosis emarginata Jaschhof & Jaschhof, 2019

Morphological identification

Jaschhof & Jaschhof (2019a).

DNA barcode

The CO1 sequence (640bp) of the specimen listed below is available in BIN BOLD:AEY6609. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Allgäu, Balderschwang, Leiterberg; 47°48′58″ N, 10°08′99″ E; elev. 1290 m; 17 May–3 Jun. 2017; D. Doczkal and J. Voith leg.; Malaise trap; BOLD DTIII8491-22; ZSM-DIP-42474-C04.

Distribution

Germany (new record); Sweden, Czech Republic (Gagné & Jaschhof 2021).

Neurepidosis gracilis Spungis, 1987

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequences (651–652bp) of the two specimens listed below are available in BIN BOLD:ACP6066. Search on BOLD's BIN Database (accessed 26 Aug. 2023) retrieved a further 26 matches for this BIN, all as Cecidomyiidae sp. from Canada (11 matches), Norway (11), Germany (three), and Russia (one).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Bavaria, Rudelzhausen; 48°57′84″ N, 11°86′26″ E; elev. 520 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10070-21; ZSM-DIP-42304-H11 • 1 ♂; Deggendorf; 48°84′01″ N, 12°96′62″ E; elev. 377 m; 14 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10242-21; ZSM-DIP-42306-G05.

Distribution

Germany (new record); Sweden, Estonia, Latvia (Gagné & Jaschhof 2021).

Neurepidosis grytsjoenensis Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:ACX3049. Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Bavaria, Germany (accessed 26 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Allgäu, Balderschwang, Leiterberg; 47°48′58″ N, 10°08′99″ E; elev. 1290 m; 17 May–3 Jun. 2017; D. Doczkal and J. Voith leg.; Malaise trap; BOLD DTIII8485-22; ZSM-DIP-42474-C06 • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′15″ N, 11°18′26″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; ZSM-DIP-42303-D01 • 1 ♂; same data as for preceding; ZSM-DIP-42303-D02 • 1 ♂; same data as for preceding but 47°93′88″ N, 11°18′44″ E; nutrient-poor pasture; ZSM-DIP-42303-F07.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Neurepidosis hartschimmelhofensis sp. nov.
urn:lsid:zoobank.org:act:D08F9174-BB33-40C8-B928-E0F2297AEAB0
Fig. 13A

Diagnosis

The new species differs from all *Neurepidosis* described in the past by its gonocoxal synsclerite, whose ventral emargination has an unusually complex structure (Fig. 13A). In ventral view, the broadly sclerotized margins of the emargination appear to be double-layered, with both layers intertwined in a complicated way. Larvae and females of *N. hartschimmelhofensis* sp. nov. are unknown.

Etymology

The name refers to the type locality, Hartschimmelhof in southern Upper Bavaria, where the farmstead Gut Hartschimmel maintains a cultural landscape with extraordinarily rich biodiversity, thanks to many decades of practising extensive farming.

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; ZSM-DIP-42303-B09.

Other characters

Male

Body length. 1.4 mm.

Head. Eye bridge dorsally 1–2 ommatidia long. Scape and pedicel brighter than flagellum. Length of flagellum unknown, only 10 flagellomeres retained; neck of fourth flagellomere 1.2× as long as node (all flagellomeres are collapsed, the reason why the fourth is not illustrated here). Palpus 4-segmented, shorter than head height.

Wing. Longer than body. Length / width ratio 2.8.

Legs. Acropods not retained.

Terminalia (Fig. 13A). Posterior margin of ninth tergite almost straight, weakly sclerotized except for a small, sclerotized reinforcement medially. Gonocoxal synsclerite slightly broader than long (not considering the long dorsal apodemes that protrude beyond the anterior gonocoxal margin); ventral setae unusually sparse, confined mostly to posterior portions; ventral emargination narrow and unusually deep, below the emargination a more darkly pigmented area without setae or microtrichia; dorsoposterior

portions only slightly protruding beyond ventroposterior portions. Gonostylus compact, barely twice as long as high, its apex narrowly rounded, covered with dense, large microtrichia. Tegmen strongly narrowed towards apex, with about 3 pairs of tiny, inconspicuous barbs subapically. Aedeagal apodeme massive, strongly sclerotized; its greatly extended base protrudes beyond anterior gonocoxal margin; apex weakly sclerotized, transitions seamlessly into tegminal apex.

Neurepidosis minuta Spungis, 1987

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42303-H10 • 1 ♂; same data as for preceding; ZSM-DIP-42303-H11 • 1 ♂; same data as for preceding; ZSM-DIP-42306-C08 • 1 ♂; same data as for preceding; ZSM-DIP-42306-C12. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow; ZSM-DIP-42303-G06 • 1 ♂; same data as for preceding; ZSM-DIP-42303-G07 • 1 ♂; same data as for preceding; ZSM-DIP-42303-G08 • 1 ♂; same data as for preceding but 47°94′23″ N, 11°18′30″ E; 12 Jun. 2020; ZSM-DIP-42303-G11.

Distribution

Germany (new record); Sweden, Latvia (Gagné & Jaschhof 2021).

Neurepidosis simplex sp. nov.

urn:lsid:zoobank.org:act:C9E9AACA-A13F-4A11-BDB2-686DB9BCB1C4

Fig. 13B–C

Diagnosis

This new species of *Neurepidosis* is peculiar for the plain construction of male terminalia structures, such as the simply subtrapezoid ninth tergite and the unmodified subcylindrical gonostylus. The elongate tegmen, which is slightly constricted medially, has unusually robust lateral walls (↓[1], Fig. 13B) and the aedeagal apodeme is unusually short and poorly sclerotized (↓[2]). Larvae and females of *N. simplex* sp. nov. are unknown.

Etymology

The specific epithet, the Latin adjective for ‘simple’, refers to the uncomplicated terminalia structures.

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′28″ N, 8°33′35″ E; elev. 111 m; 3–10 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow scrub and reed; ZSM-DIP-42306-D03.

Paratypes

GERMANY • 1 ♂; same data as for the holotype but 12–26 Apr. 2020; ZSM-DIP-42475-E03 • 1 ♂; same data as for preceding; ZSM-DIP-42475-E07 • 1 ♂; same data as for preceding; ZSM-DIP-42475-E09.

Other characters

Male

Body length. 1.6 mm.

Head. Eye bridge devoid of ommatidia dorsally. Scape and pedicel concolorous with flagellum. 14 flagellomeres; circumfila with 2 long posterior extensions, present on flagellomeres 1–11; neck of fourth flagellomere 1.2 × as long as node (Fig. 13C). Palpus 4-segmented, shorter than head height.

Wing. Longer than body. Length / width ratio 2.9.

Legs. Acropods: claws with single large tooth basally, empodia vestigial.

Terminalia (Fig. 13B). Posterior margin of ninth tergite straight or slightly concave. Gonocoxal synsclerite broader than long; ventral setae large; ventral emargination deeply V-shaped, its base reinforced by sclerotized margin; dorsoposterior portions markedly protruding beyond ventroposterior portions. Gonostylus twice as long as high, slightly tapered apically. Tegmen strongly sclerotized, elongate, slightly constricted beyond midlength, apex broad, truncate. Aedeagal apodeme hardly discernible, about as long as gonocoxal dorsal apodemes.

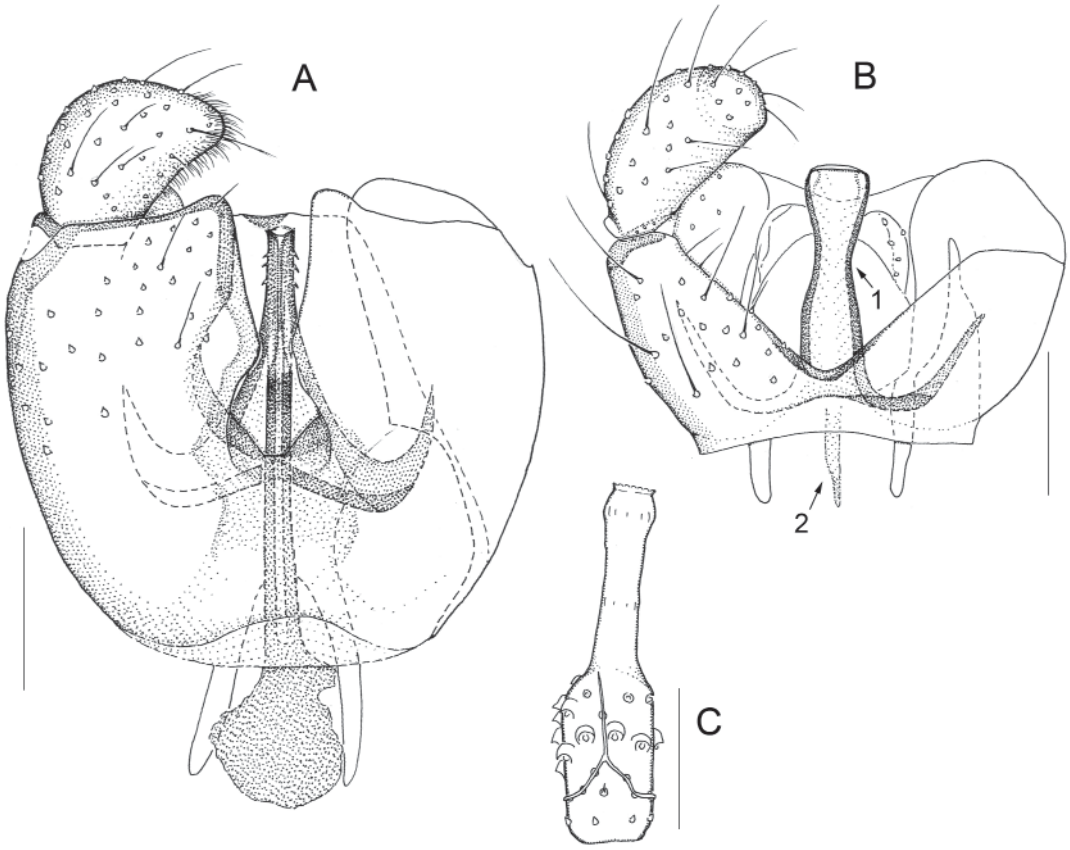

Fig. 13. A. *Neurepidosis hartschimmelhofensis* sp. nov., holotype, ♂ (ZSM-DIP-42303-B09), terminalia, ventral view. – **B–C**. *N. simplex* sp. nov., holotype, ♂ (ZSM-DIP-42306-D03). **B**. Terminalia, ventral view. **C**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Genus ***Paratetraneuromyia*** Spungis, 1987

Paratetraneuromyia comprises two subgroups, one in the Holarctic region with three species and another in New Zealand with two species (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2013, 2022). As shown here, the German fauna has two species of this genus.

Paratetraneuromyia nobilis (Felt, 1908)

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhr, Postlohe, Sattelbogenweiher; 49°26′86″ N, 12°37′88″ E; elev. 382 m; 29 Aug.–10 Sep. 2016; D. Doczkal and J. Voith leg.; Malaise trap; pond edge; ZSM-DIP-42305-B04.

Distribution

Germany (new record); UK, Sweden, Latvia, USA (Gagné & Jaschhof 2021).

Paratetraneuromyia vernalis Spungis, 1987

Morphological identification

Spungis (1987).

DNA barcode

CO1 sequences (643–651bp) of the two specimens listed below are available in BIN BOLD:AEI3566. Search on BOLD's BIN Database retrieved a further five matches for this BIN, as Cecidomyiidae sp. from Norway (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′56″ N, 8°33′20″ E; elev. 110 m; 1–15 Mar. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow scrub at pond edge; BOLD GBDTA10017-21; ZSM-DIP-42304-D06 • 1 ♂; same data as for preceding but 48°91′3″ N, 8°33′4″ E; elev. 111 m; windthrow of willow and aspen trees; BOLD DTIII8531-22; ZSM-DIP-42474-G04.

Distribution

Germany (new record); Sweden, Finland, Estonia, Latvia (Gagné & Jaschhof 2021).

Tribe **Porricondylini** Kieffer, 1913

Porricondylini is the largest tribe of the subfamily Porricondylinae both in terms of generic and specific diversity (Gagné & Jaschhof 2021). Of 35 genera found in Europe, 15 were previously known to occur in Germany (Jaschhof & Jaschhof 2021b). A further 15 genera, including a new genus named *Wohllebenia* gen. nov., are reported here as new additions to the German fauna. Only a few small genera now remain undetected in Germany, notably *Dendrepidosis* Mamaev, 1990, *Glossostyles* Jaschhof & Sikora, 2017, and *Jamalepidosis* Mamaev, 1990. The fact that these genera occur in Sweden (Jaschhof & Jaschhof 2013, 2020a) gives reason to expect their presence in Germany too.

Genus ***Bryocrypta*** Kieffer, 1896

Bryocrypta had previously five species in Europe, of which four were taxonomically revised in recent years (Jaschhof & Jaschhof 2013, 2020a). The fifth species, *B. vesiculosa* Kieffer, 1913, was described from larvae collected on a single occasion in France and not found again since (Gagné & Jaschhof 2021). The present project identified a new species of this genus, which is described below. Apart from this, the German fauna contains two other *Bryocrypta*, of which one was reported earlier (Jaschhof & Jaschhof 2021b), and the other is documented here.

Bryocrypta indubitata Mamaev, 1964

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhrer Forst; 49°26′87″ N, 12°35′25″ E; elev. 390 m; 7–29 Aug. 2016; D. Doczkal and J. Voith leg.; Malaise trap; sandy edge of pine forest; ZSM-DIP-42304-G02 • 1 ♂; same data as for preceding; ZSM-DIP-42304-G03 • 1 ♂; same data as for preceding; ZSM-DIP-42304-G04.

Distribution

Germany (new record); widespread in Europe, South Korea (Gagné & Jaschhof 2021).

Bryocrypta longissima sp. nov.

urn:lsid:zoobank.org:act:1C3CD264-1E21-47FE-9348-CD7FD75C6B2B

Fig. 14

Differential diagnosis

Morphology

In terms of male morphology (larvae and females are unknown) the new species is a typical *Bryocrypta*. It resembles *B. indubitata*, with which it shares the very long gonostylus, the large ventroposterior outgrowths of the gonocoxal synsclerite, and the elongate-triangular tegmen (Fig. 14A). As regards distinctions, the gonocoxal synsclerite of *B. longissima* sp. nov. lacks the subtriangular lobes so prominently developed in *B. indubitata* (Jaschhof & Jaschhof 2013: fig. 80a), with the result that the ventroposterior outgrowths are only slightly convex laterally, not strongly bulging (↓[1], Fig. 14A). Also, the gonostylus of *B. longissima* is 1.6× as long as the tegmen (Fig. 14A) and thus longer than that of *B. indubitata*, where this factor is just 1.3. Finally, the flagellomeral necks of *B. longissima* are markedly shorter compared with those of *B. indubitata*: for the fourth flagellomere, the neck-to-node ratio is 1.1 in *B. longissima* (Fig. 14B) and 1.6–1.8 in *B. indubitata* (Jaschhof & Jaschhof 2013: fig. 80c). The description of *B. mamaevi* Fedotova, 2013 from Ethiopia (Fedotova 2013) suggests that species closely resembles *B. longissima*. On the assumption that the provided information is correct, *B. mamaevi* is distinguished from *B. longissima* (characters in parentheses) by the palpus consisting of a variable 2 or 3 segments (3 or 4 segments) and by the basal flagellomeres having the necks slightly shorter than the nodes (necks slightly longer than nodes). Fedotova's illustrations of the terminalia of *B. mamaevi* (n = 14) suggest an unusually great variation in the shape of the gonostylus (Fedotova 2013: figs 17–20, 28–29), which raises doubts about the accuracy of the drawings and the conspecifity of the specimens.

DNA barcode

CO1 sequences (653bp) of the two paratype specimens are available in BIN BOLD:AER0394. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Etymology

The specific epithet, meaning 'longest', refers to the exceptional length of the gonostylus.

Type material

Holotype

GERMANY • ♂; Bavaria, Munich, Allacher Lohe Nature Reserve; 48°19′88″ N, 11°47′54″ E; elev. 502 m; 21 Jul.–4 Aug. 2021; GBOL and R. Albrecht leg.; Malaise trap; heathland; ZSM-DIP-42307-C11.

Paratypes

GERMANY • 1 ♂; same data as for the holotype; BOLD GBDTA10288-21; ZSM-DIP-42307-C04 • 1 ♂; same data as for preceding; BOLD GBDTA10294-21; ZSM-DIP-42307-C10°

Other characters

Male

Body length. 1.3–1.5 mm.

Head. Antenna longer than body; scape and pedicel brighter than flagellum; circumfila on flagellomeres 1 to either 9 or 10 irregularly sinuous (Fig. 14B). Palpus markedly shorter than head height, either 4-segmented, with third and fourth segments equally long, or 3-segmented, with third segment slightly longer than second.

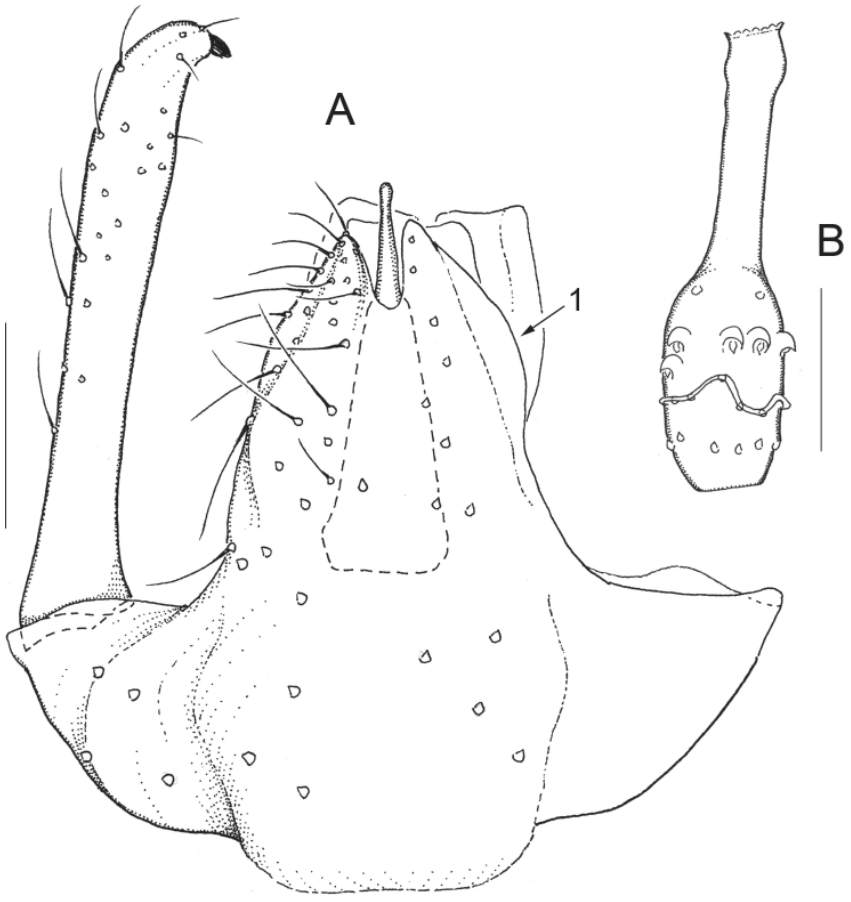

Fig. 14. *Bryocrypta longissima* sp. nov. **A**. Holotype, ♂, terminalia, ventral view (ZSM-DIP-42307-C11). **B**. Paratype, ♂, fourth flagellomere, lateral view (ZSM-DIP-42307-C04). Scale lines: 0.05 mm. The numbered arrow indicates a diagnostic character (see text).

Wing. As long as body. Length / width ratio 2.9.

Legs. Acropods: claws toothless, strongly bent beyond midlength, empodia two thirds as long as claws.

Terminalia (Fig. 14A). Gonostylus straight except for an abrupt bend apically, slightly thicker subapically than subbasally; setae short and sparse. Tegmen: apex directed posteriad rather than ventrad; outline of anterior margin varying, either straight or concave.

Genus ***Cassidoides*** Mamaev, 1964

Of seven species previously classified in this genus, two are Neotropical, one is Holarctic, and four are exclusively Palearctic in distribution (Jaschhof & Jaschhof 2013; Gagné & Jaschhof 2021; de Almeida Garcia *et al.* 2023a). Two species described here as new plus two first-time records raise the number of *Cassidoides* known from Germany to five.

Cassidoides corticalis (Mamaev, 1964)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (651–652bp) of the two specimens listed below are available in BIN BOLD:AEI7965. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂, Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA9968-21; ZSM-DIP-42303-H04. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; GBOL and D. Doczkal leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA9900-21; ZSM-DIP-42303-B08.

Distribution

Germany (new record); Sweden, Estonia, Latvia, European part of Russia (Gagné & Jaschhof 2021).

Cassidoides fulviventris (Mamaev, 1964)

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhr, Postlohe, Sattelbogenweiher; 49°26′86″ N, 12°37′88″ E; elev. 382 m; 29 Aug.–10 Sep. 2016; D. Doczkal and J. Voith leg.; Malaise trap; pond edge; ZSM-DIP-42305-B01 • 1 ♂; Upper Palatinate, Bodenwöhrer Forst; 49°26′87″ N, 12°35′25″ E; elev. 390 m; 8–25 Jun. 2016; D. Doczkal and J. Voith leg.; Malaise trap; sandy edge of pine forest; ZSM-DIP-42305-D01 • 1 ♂; same data as for preceding; ZSM-DIP-42305-D07.

Distribution

Germany (new record); Sweden, Estonia, Ukraine, European and Far Eastern parts of Russia (Gagné & Jaschhof 2021).

Cassidoides rainensis sp. nov.
urn:lsid:zoobank.org:act:261A047E-B4F8-4780-BD17-451BB5F40503
Fig. 15A–B

Diagnosis

Morphology

Cassidoides rainensis sp. nov. differs from congeneric species in a combination of male terminalia characters, as follows (Fig. 15B). The aedeagal apodeme is markedly longer than the gonocoxae (↓[1]), the tegmen is inversely U- rather than V-shaped (↓[2]), and the long, apically hooked gonocoxal processes run parallel and in close proximity to the tegmen (↓[3]). Larvae and females of the new species are unknown.

DNA barcode

The CO1 sequence (654bp) of the holotype specimen is available in BIN BOLD:ACY6187. Search on BOLD's BIN Database retrieved a further match for this BIN, as Diptera sp. from Mecklenburg-Vorpommern, Germany (accessed 26 Aug. 2023).

Differential diagnosis

Cassidoides rainensis sp. nov. resembles *C. fulvus* (Kieffer, 1896), a widespread Holarctic species, in the shape of the gonostylus and the length of the aedeagal apodeme. However, in *C. fulvus* the apex of the aedeagal apodeme is pointed, not spoon-shaped; the tegmen resembles an inverse V rather than U; and the gonocoxal processes, which are situated at some distance from the tegmen, are evenly bent dorsolaterad (Jaschhof & Jaschhof 2013: fig. 145b).

Etymology

The name is derived from the type locality, Rain, a small town in Lower Bavaria.

Type material

Holotype

GERMANY • ♂; Bavaria, Lower Bavaria, Rain; 48°64′61″ N, 11°01′89″ E; elev. 429 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10247-21; ZSM-DIP-42306-G10.

Other characters

Male

Body length. 1.8 mm.

Head. Eye bridge dorsally 1–2 ommatidia long. Antenna as long as body; scape and pedicel brighter than flagellum; 12 flagellomeres; apical flagellomere long, composed of two nodes; circumfila present on all flagellomeres, irregularly sinuous; neck of fourth flagellomere 1.7× as long as node (Fig. 15A). Palpus 4-segmented, markedly shorter than head height.

Wing. As long as body. Length/width ratio 2.6. M_4 missing, CuA ending well before wing margin.

Legs. Acropods, to assess structure of claws and empodia, lost.

Terminalia (Fig. 15B). Gonocoxal synsclerite broader than long, with dense setae of very different lengths ventrally; ventral emargination faintly contoured, apparently U-shaped. Gonostylus upright, twice as long as thick; outside with numerous setae of various lengths; inside slightly excavated, sparsely setose incl. 2–3 long subapical bristles; pectinate claw of moderate size. Apex of aedeagal apodeme membranous rather than sclerotized. Tegminal apex bent slightly dorsad, blunt-ended with minor indentation.

Cassidoides riparius sp. nov.
urn:lsid:zoobank.org:act:1FDC3219-DA56-426D-BA25-4749179C9D63
Fig. 15C–E

Diagnosis

Morphology

Cassidoides riparius sp. nov. is one of the smallest species known of the genus. The male is barely 1.3 mm long and its terminalia are of tiny dimensions (Fig. 15D). A terminalia structure peculiar to this species relates to the gonocoxal processes, which each consist of a broad, presumably flattened portion basally that transitions into a thick, tusk-shaped portion apically (↓[4], Fig. 15D). Larvae and females of the new species are unknown.

DNA barcode

The CO1 sequence (653bp) of the holotype specimen is available in BIN BOLD:AER0232. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

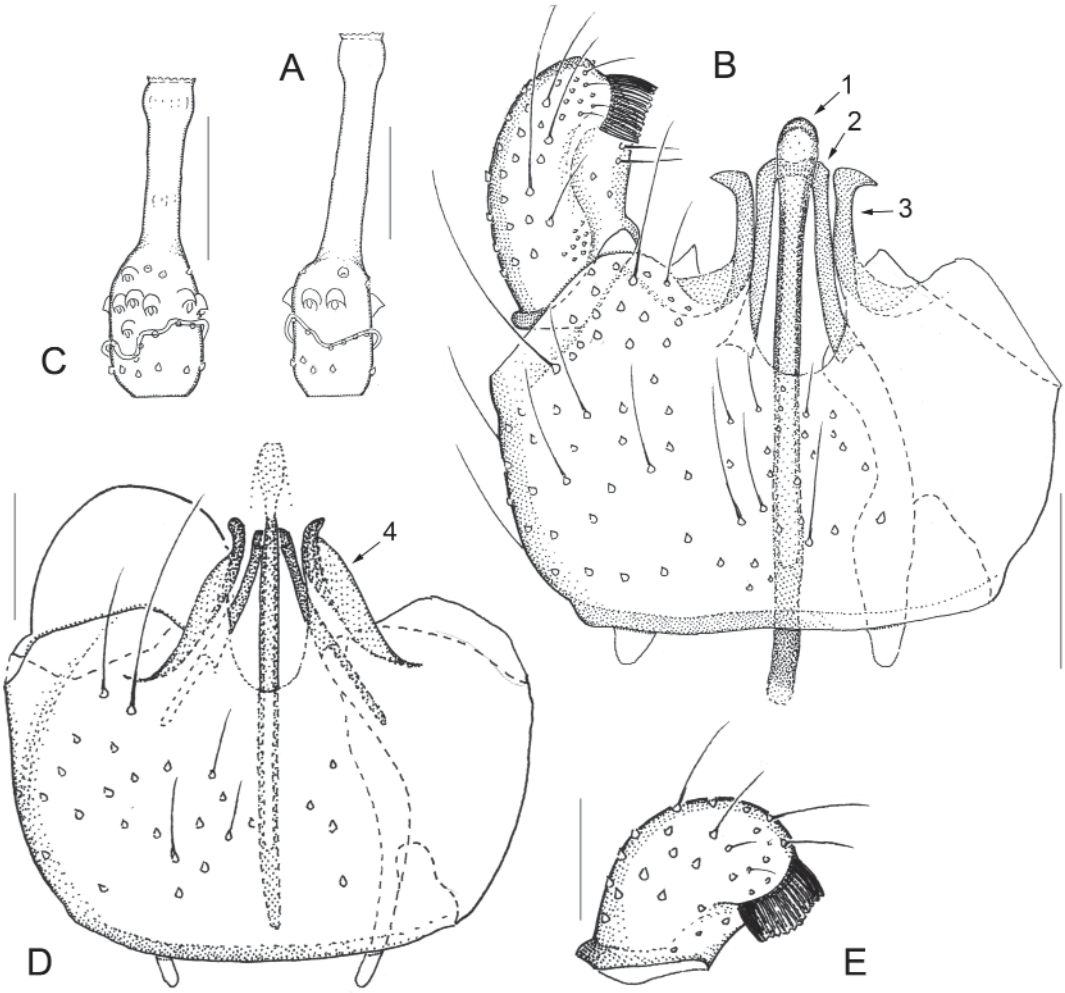

Fig. 15. A–B. *Cassidoides rainensis* sp. nov., holotype, ♂ (ZSM-DIP-42306-G10). **A**. Fourth flagellomere, lateral view. **B**. Terminalia, ventral view. – **C–E**. *C. riparius* sp. nov., holotype, ♂ (ZSM-DIP-42307-B10). **C**. Fourth flagellomere, lateral view. **D**. Terminalia, ventral view. **E**. Gonostylus, ventral view. Scale lines: A–C = 0.05 mm; D–E = 0.025 mm. The numbered arrows indicate diagnostic characters (see text).

Etymology

The Latin adjective '*riparius*' means 'living on the riverbank', an allusion to the habitat in which the holotype specimen was collected.

Type material

Holotype

GERMANY • ♂; Bavaria, Moos, Isar estuary; 48°78′60″ N, 12°95′94″ E; elev. 313 m; 29 Jul.–12 Aug. 2021; GBOL and R. Albrecht leg.; Malaise trap; hardwood floodplain forest; BOLD GBDTA10282-21; ZSM-DIP-42307-B10.

Other characters

Male

Head. Eye bridge dorsally 1–2 ommatidia long. Antenna shorter than body; scape and pedicel brighter than flagellum; 12 flagellomeres; apical flagellomere long, composed of two nodes; circumfila present on all flagellomeres, irregularly sinuous; neck of fourth flagellomere 1.1 × as long as node (Fig. 15C). Palpus 4-segmented, nearly as long as head height.

Wing. Slightly longer than body. Length / width ratio 2.7. M_4 extremely faint, CuA ending well before wing margin.

Legs. Acropods, to assess structure of claws and empodia, not retained.

Terminalia (Fig. 15D). Gonocoxal synsclerite broader than long, with dense setae of very different lengths ventrally; ventral emargination faintly contoured, apparently U-shaped. Gonostylus compact, 1.5 × as long as thick; outside with numerous setae of various lengths; inside slightly excavated, sparsely setose incl. 2–3 long subapical bristles; pectinate claw broad, slightly undulated (Fig. 15E). Aedeagal apodeme about as long as gonocoxae, its sclerotized portion narrowed apically and covered by membranous cap. Tegmen: shaped like inverted V, apex bent slightly dorsad, blunt with small indentation.

Genus ***Claspettomyia*** Grover, 1964

The genus *Claspettomyia* previously comprised 35 species from all biogeographic regions but the Australasian/Oceanian region (Gagné & Jaschhof 2021; de Almeida Garcia *et al.* 2023b). Several of the eight species found in Europe also occur in Asia or North America (here marked with asterisks): *C. carpatica* Mamaev, 1998, *C. formosa* (Bremi, 1847)*, *C. hamata* (Felt, 1907)*, *C. niveitarsis* (Zetterstedt, 1850)*, *C. paneliusi* Mamaev, 1998, *C. rossica* Mamaev, 1998, *C. toelgi* (Kieffer, 1913)*, and *C. ussuriensis* Mamaev, 1998*. In their revision of the *Claspettomyia* of Sweden, Jaschhof & Jaschhof (2013: 274) recognized five species, including *C.* aff. *kirghizica* Mamaev, 1998, which to our current knowledge is an unnamed species. The treatment of *Claspettomyia* in the present paper proceeds where the 2013 revision ended, with the novelty that the delimitation of species is now supported by CO1 sequences, if available. As regards the merit of morphological structures for defining species, the suggestions by Jaschhof & Jaschhof (2013: 275) remain valid. Also, the need to revise the taxonomy of northern hemisphere *Claspettomyia* persists, although such an ambition seems unrealistic insofar as the bulk of the critical material is deposited in hard-to-reach collections in Russia, China, and India (Gagné & Jaschhof 2021). The fact that morphological descriptions of *Claspettomyia* in the literature are all too often insufficient for the purpose of species identification affects also the present project. Of 11 species identified here, only six can be related to a specific name: *C. hamata* and *C. toelgi*, both recognized earlier as occurring in Germany (Jaschhof & Jaschhof 2021b), two first-time records, and two new species, which are described and named below. The remaining five species resemble in various ways *C. carpatica*, *C. formosa*, *C. hamata*, and *C. niveitarsis*, but I am unable to decide whether they are undescribed or unidentifiable from the literature.

Claspettomyia carpatica Mamaev, 1998
Fig. 16A

I studied the holotype male of *C. carpatica* in 2012. A sketch of the terminalia made at that time puts me in a position to conclude that a single *Claspettomyia* male studied here from Baden-Württemberg belongs to the same species. The specimen from Germany is illustrated here (Fig. 16A).

Revised diagnosis

Claspettomyia carpatica differs from congeneric species in characters of the male terminalia, as follows. The apical bulge of the gonostylus is moderately large, subglobular, and covered with long dense microtrichia, fine setae, and about 2 stiff bristles (↓[1], Fig. 16A); the apices of the gonocoxal processes have 2–3 small knobs subterminally and are bent ventrad (↓[2]); the protuberances near the gonostylar

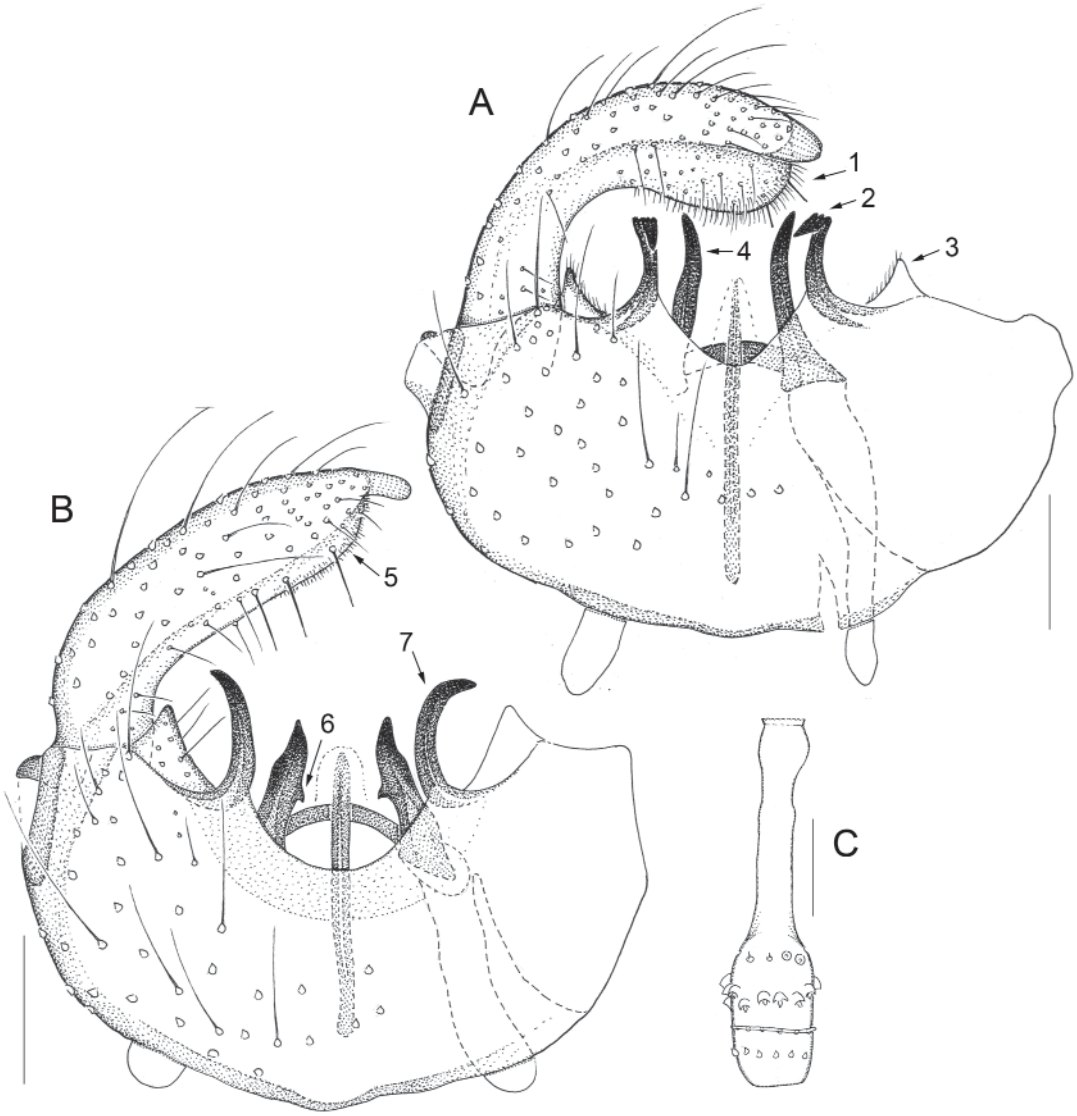

Fig. 16. A. *Claspettomyia carpatica* Mamaev, 1998, ♂ (ZSM-DIP-42305-D11), terminalia, ventral view. – **B–C**. *C. gracilostylus* sp. nov., holotype, ♂ (ZSM-DIP-42305-D02). **B**. Terminalia, ventral view. **C**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

bases are moderately large, pointed, and densely covered with microtrichia (↓[3]); and the parameres are tusk-shaped, moderately long, and slighly bent dorsad (↓[4]). The specimen studied here (ZSM-DIP-42305-D11) corresponds with the holotype in that the eye bridge is 4–5 ommatidia long dorsally and the neck of the fourth flagellomere is 1.5 × as long as the node.

Differential diagnosis

Claspettomyia carpatica is one of several species resembling *C. niveitarsis*, a rather common and widespread species in Europe. In contrast to *C. carpatica*, the gonostylar bulge of *C. niveitarsis* has 4–5 stiff bristles, the apices of the gonocoxal processes are smooth, and the neck of the fourth flagellomere is 1.7–2.1 × as long as the node (Jaschhof & Jaschhof 2013: 280, fig. 132b). A further broadly similar species is *C. rossica*, whose holotype I examined in 2012. Studied here were also nine males in the Penttinen collection that proved the occurrence of *C. rossica* in Finland (Jaschhof *et al.* 2014). From this it appears that *C. rossica* differs from *C. carpatica* in the gonostylar bulge, which is slightly more prominent and equipped with up to 5 stiff bristles; in the parameres, whose knobs tend to be more numerous and slightly larger; in the gonocoxal protuberances, which have setae in addition to microtrichia; in the longer eye bridge, which consists of 7–8 ommatidia dorsally; and in the longer flagellomeral necks, with the neck-to-node ratio being 1.7–1.9 in the fourth flagellomere.

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 28 Jun.–5 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42305-D11.

Distribution

Germany (new record); Ukraine (Gagné & Jaschhof 2021).

Remarks

Two males studied here from Rimpar, Bavaria, deviate slightly from the diagnosis given above for *C. carpatica*: the basal portion of the gonostylus is slightly thicker; the gonocoxal protuberances next to the gonostylar bases are less prominent and devoid of vestiture; the parameres are possibly more strongly bent; the eye bridge is shorter dorsally (2–3 ommatidia); the neck of the fourth flagellomere is slightly longer (1.7 × the node); and the palpus is shorter than the head height (versus longer than the head height in *C. carpatica*). The two specimens likely represent a species distinct from *C. carpatica*, which is labeled *C.* sp. MJDE5 in the list at the end of this paper. A DNA barcode was obtained here for *C.* sp. MJDE5 (BIN BOLD:AER0015) but unfortunately not for *C. carpatica*.

Claspettomyia gracilostylus sp. nov.
urn:lsid:zoobank.org:act:61B40CA6-BD76-4BFC-8E83-64E7B78D7303
Fig. 16B–C

Diagnosis

Morphology

Males of *C. gracilostylus* sp. nov. differ from those of other *Claspettomyia* in a combination of several terminalia characters: the slender, nearly parallel-sided gonostylus lacks an apical bulge (↓[5], Fig. 16B), the short, robust parameres have small, barb-like processes dorsomedially (↓[6]), and the long, slender gonocoxal processes are strongly bent ventrolaterad (↓[7]). Larvae and females of the new species are unknown.

DNA barcode

The CO1 sequence (652bp) of the paratype specimen detailed below is available in BIN BOLD:AER0010. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 13 Feb. 2023).

Differential diagnosis

The only other *Claspettomyia* whose gonostylus lacks an apical bulge is *C. corniculata* Mamaev, 1998 from the Far East of Russia. The terminalia illustration of the holotype specimen (Mamaev 1998: fig. 4) suggests that the parameres are unusually short (even shorter than in *C. gracilostylus* sp. nov.) and bifid apically, and the unbent gonocoxal processes point posteriad. In *Claspettomyia* aff. *kirghizica* (cf. Jaschhof & Jaschhof 2013: 278, fig. 132a), a further superficially similar species, the gonostylus is slightly swollen apically and the parameres are thin and barbless.

Etymology

The specific epithet, a noun in apposition, highlights the slender gonostylus characteristic of this species.

Type material

Holotype

GERMANY • ♂; Bavaria, Upper Palatinate, Bodenwöhrer Forst; 49°26′87″ N, 12°35′25″ E; elev. 390 m; 8–25 Jun. 2016; D. Doczkal and J. Voith leg.; Malaise trap; sandy edge of pine forest; ZSM-DIP-42305-D02.

Paratypes

GERMANY • 1 ♂; same data as for the holotype but 7–29 Aug. 2016; ZSM-DIP-42304-G09 • 1 ♂; same data as for preceding; 29 Aug.–10 Sep. 2016; ZSM-DIP-42305-C08 • 1 ♂; same data as for preceding; BOLDGBDTA10103-21; ZSM-DIP-42305-C09.

Other characters

Male

Body length. 1.7–2.0 mm.

Head. Eye bridge dorsally 4–5 ommatidia long. Antenna longer than body; scape and pedicel somewhat brighter than flagellum; flagellomeral nodes unpigmented; circumfila present on flagellomeres 1–11; neck of fourth flagellomere 1.5 × as long as node (Fig. 16C). Palpus 1.4 × as long as head height.

Wing. Longer than body. Length / width ratio 2.9.

Terminalia (Fig. 16B). Gonocoxal synsclerite: ventral emargination broadly U-shaped, with broad, darkly pigmented margin anteriorly; protuberances near gonostylar bases large, pointed, with sparse microtrichia of normal size and several fine setae. Gonostylus markedly bent subbasally, then straight; apex with plate-like tooth; outside with numerous setae of various lengths; inside more sparsely setose, including 2–3 long subapical bristles.

Claspettomyia niveitarsis (Zetterstedt, 1850)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (653bp) of the specimen detailed below is available in BIN BOLD:AER0011. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 26 Aug. 2023).

Material examined

GERMANY– **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 28 Jun.–5 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42304-A05 • 1 ♂; same data as for preceding but 21–28 Jun. 2020; BOLD GBDTA10122-21; ZSM-DIP-42305-E04 • 1 ♂; same data as for preceding; ZSM-DIP-42305-E06. – **Bavaria** • 1 ♂; Bayreuth; 49°93′55″ N, 11°57′36″ E; elev. 343 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-G04 • 1 ♂; Lower Franconia, Rimpar; 49°85′93″ N, 9°95′34″ E; elev. 279 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-F01 • 1 ♂; same data as for preceding; ZSM-DIP-42306-F04.

Distribution

Germany (new record); widespread in Europe, Kirghizstan, China? (Gagné & Jaschhof 2021).

Claspettomyia parvidentata sp. nov.
urn:lsid:zoobank.org:act:1C5EE96F-A72D-4059-8174-28BB985004AD
Fig. 17

Differential diagnosis

Morphology

Claspettomyia parvidentata sp. nov. and *C. toelgi* are the only species of *Claspettomyia* in which the gonostylar tooth is not shaped like a fingernail but consists of several separate spines that form a comb. In the new species, the comb is made of about 4 spines, which hardly stand out from the gonostylar bulge's dense cover with microtrichia and fine setae (↓[1], Fig. 17A), whereas in *C. toelgi* the comb is about twice that size and fairly conspicuous (Jaschhof & Jaschhof 2013: fig. 133b). Further differences concern the parameres, which are nearly straight and point posteriad in *C. parvidentata* (↓[2]) versus strongly bent dorsad in *C. toelgi*, and the gonocoxal processes whose portions beyond the apical bend are markedly shorter in *C. parvidentata* (↓[3]) compared with *C. toelgi* (Jaschhof & Jaschhof 2013: fig. 133b). As regards non-terminalia distinctions, the eye bridge of *C. parvidentata* is markedly shorter dorsally compared with that of *C. toelgi* (2–3 ommatidia versus 7–8 ommatidia) and the flagellomeral necks of *C. parvidentata* are shorter (1.5–1.7 versus 2.0–2.2 times the nodal length in the fourth flagellomere, Fig. 17B) and lack the dark pigmentation found in *C. toelgi*. Larvae and females of the new species are unknown.

DNA barcode

CO1 sequences (651–652bp) of two paratype specimens detailed below are available in BIN BOLD:AER0014. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Etymology

The specific epithet, an adjective, means 'small-toothed', with reference to the inconspicuous gonostylar tooth typical of this species.

Type material

Holotype

GERMANY – **Bavaria** • ♂; Lower Franconia, Esselbach; 49°86′74″ N, 9°53′81″ E; elev. 313 m; 17 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-G02.

Paratypes

GERMANY – **Bavaria** • 1 ♂; same data as for the holotype; ZSM-DIP-42305-G01 • 1 ♂; Upper Bavaria, Rudelzhausen; 48°57′84″ N, 11°86′26″ E; elev. 520 m; 16 Jul. 2019; LandKlif and J. Müller leg.;

Malaise trap; BOLD GBDTA10074-21; ZSM-DIP-42305-A04 • 1 ♂; same data as for preceding; BOLD GBDTA10075-21; ZSM-DIP-42305-A05 • 1 ♂; Lower Franconia, Rimpar; 49°85′93″ N, 9°95′34″ E; elev. 279 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-C10 • 1 ♂; same data as for preceding; ZSM-DIP-42306-F10 • 1 ♂; Lower Franconia, Kolitzheim; 49°92′17″ N, 10°23′42″ E; elev. 229 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-B09°

Other characters

Male

Body length. 1.7–2.0 mm.

Head. Antenna longer than body; scape and pedicel brighter than flagellum; circumfila present on flagellomeres 1–12. Palpus 1.5 × as long as head height.

Wing. About as long as body. Length / width ratio 2.8.

Terminalia (Fig. 17A). Gonocoxal synsclerite: ventral emargination U-shaped, with narrow, darkly pigmented margin anteriorly; 2 pairs of processes arising from a common base, dorsal pair less than half the size of ventral pair, both pointing ventrad; protuberances near gonostylar bases inconspicuous, pointed, with several fine setae. Gonostylus markedly bent near midlength; outside with numerous setae of various lengths; inside very sparsely setose; apical bulge large, subglobular, with 2–3 subapical bristles.

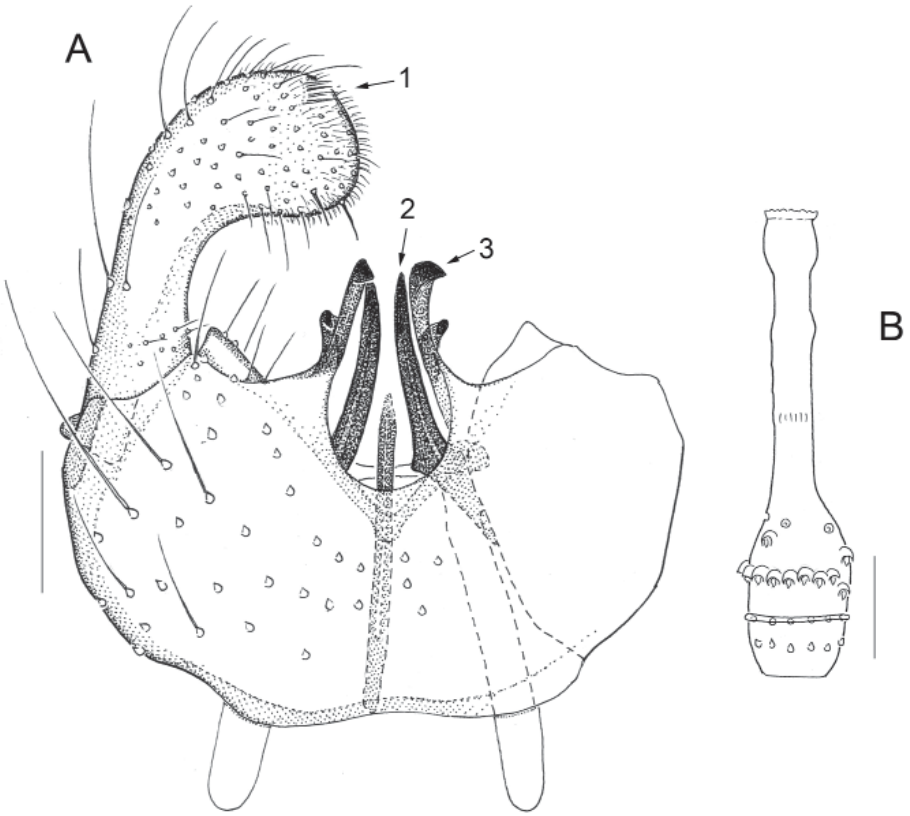

Fig. 17. *Claspettomyia parvidentata* sp. nov., holotype, ♂ (ZSM-DIP-42305-G02). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Genus ***Coccopsilis*** Harris, 2004

Coccopsilis, a genus close to *Cassidoides*, contains one Holarctic and nine exclusively Palearctic species (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2013). Two species of *Coccopsilis* are known to occur in Germany, including a first-time record reported here.

Coccopsilis obscura (Mamaev, 1964)

Morphological identification

Jaschhof & Jaschhof (2013). The present project found evidence of an apparently unnamed species close to *C. obscura*. The CO1 sequence (652bp) of that species (referred to as *Coccopsilis* sp. MJDE1 in the list at the end of this paper) is available in BIN BOLD:ACP0021. Search on BOLD's BIN Database retrieved one further match for this BIN, as Cecidomyiidae sp. from China (accessed 27 Aug. 2023). In terms of morphology, the only clear distinction from *C. obscura* is that the base of the aedeagal apodeme is markedly broadened, thus resembling a stamper. The only specimen at hand is too incomplete for taxonomic description.

DNA barcode

The CO1 sequence (651bp) of the specimen marked below with an asterisk is available in BIN BOLD:ACR1420. Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Rhineland-Palatinate, Germany (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 28 Jun.–5 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42304-A05 • 1 ♂; same data as for preceding but 31 May–7 Jun. 2020; BOLD GBDTA10196-21; ZSM-DIP-42306-C07*. – **Bavaria** • 1 ♂; Lower Bavaria, Rain; 48°64′61″ N, 11°01′89″ E; elev. 429 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-G08.

Distribution

Germany (new record); widespread in Palearctic (Gagné & Jaschhof 2021).

Genus ***Cryptodontomyia*** Jaschhof, 2013

All three species known of *Cryptodontomyia*, a genus found exclusively in Europe, are rarely encountered in nature (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2013). The presence of this genus in Germany is reported here for the first time.

Cryptodontomyia elongata Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AEQ8565. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow, ZSM-DIP-42303-G05.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Cryptodontomyia nigridens (Mamaev, 1964)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen detailed below is available in BIN BOLD:AEQ8566. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA9895-21; ZSM-DIP-42303-B03 • 1 ♂; same data as for preceding; ZSM-DIP-42303-B04 • 1 ♂; same data as for preceding; ZSM-DIP-42303-B06 • 1 ♂; same data as for preceding but 47°94′30″ N, 11°18′29″ E; 9–23 Jun. 2021; ZSM-DIP-42471-G12.

Distribution

Germany (new record); Sweden, European part of Russia (Gagné & Jaschhof 2021).

Genus ***Cryptoneurus*** Mamaev, 1964

This genus comprises two species, the type species *C. muscicola* (Kieffer, 1896), which is widely distributed in the Palearctic region, and *C. paludicola* Jaschhof, 2013, previously known only from a few localities in southern Sweden (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2013, 2021a). The latter species is shown here to occur in Germany, rendering *Cryptoneurus* a new generic record for the country.

Cryptoneurus paludicola Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42303-H08.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Genus ***Dallaiella*** Mamaev, 1997

This genus contains a single species previously known from places as far apart from each other as Italy and Sweden (Jaschhof & Jaschhof 2017; Gagné & Jaschhof 2021). Its first-time record in Germany is documented here.

Dallaiella petrosa Mamaev, 1997

Morphological identification

Jaschhof & Jaschhof (2017).

DNA barcode

The CO1 sequence (651bp) of the specimen listed below is available in BIN BOLD:AEZ8063. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Spessart, Rohrbrunner Forst, Rohrberg Nature Reserve; 49°89′35″ N, 9°42′48″ E; elev. 503 m; 3–18 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; oak forest; BOLD DTIII8402-22; ZSM-DIP-42473-D06.

Distribution

Germany (new record); Sweden, Italy (Gagné & Jaschhof 2021).

Genus ***Divellepidosis*** Fedotova & Sidorenko, 2007

Twenty-three species of *Divellepidosis* described in the past are distributed across all zoogeographic regions but the Afrotropics (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2022). Of eight species previously found in Europe, three were listed by Jaschhof & Jaschhof (2021b) as occurring in Germany. A further five *Divellepidosis* are shown here to belong to the German fauna, including the newly described *D. bavarica* sp. nov. The taxonomy of this genus was reviewed twice in recent years (Jaschhof & Jaschhof 2013, 2022).

Divellepidosis armilla (Mamaev, 1994)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (640–653bp) were obtained of the five specimens detailed below and allocated to two BINs, BOLD:ACC1751 (one specimen from Bavaria) and BOLD:AEI9799 (four specimens from Baden-Württemberg). The two genetic clusters were found to be unsupported by morphology. Search on BOLD's BIN Database retrieved three matches for BOLD:ACC1751, as Cecidomyiidae sp. from Finland (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, NE of Kieswerk Glaser; 48°54′52″ N, 8°18′46″ E; 27 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; beech log in forest clearing; BOLD GBDTA10009-21;

ZSM-DIP-43304-C10 • 1 ♂; same data as for preceding; BOLD GBDTA10011-21; ZSM-DIP-43304-D01 • 1 ♂; same data as for preceding; BOLD GBDTA10012-21; ZSM-DIP-43304-C12 • 1 ♂; same data as for preceding; BOLD GBDTA10013-21; ZSM-DIP-43304-D02. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA9927-21; ZSM-DIP-42303-D11.

Distribution

Germany (new record); Sweden, Finland, Estonia, Far East of Russia (Gagné & Jaschhof 2021).

Divellepidosis bavarica sp. nov.
urn:lsid:zoobank.org:act:100E7DD4-2FD6-483D-8A34-A5E4C8A9C72E
Fig. 18

Diagnosis

A distinctive morphological structure of *D. bavarica* sp. nov. is the tegmen: its sclerotization is stronger than usually found in this genus and the construction includes unusual details, such as a pair of large, subtriangular outgrowths ventrobasally (↓[1], Fig. 18B) and a pair of tiny spikes subapically (↓[2], Fig. 18B). Larvae and females of the new species are unknown.

Etymology

The specific epithet is derived from Bavaria, the federal state where the holotype specimen was collected.

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; ZSM-DIP-42303-E06.

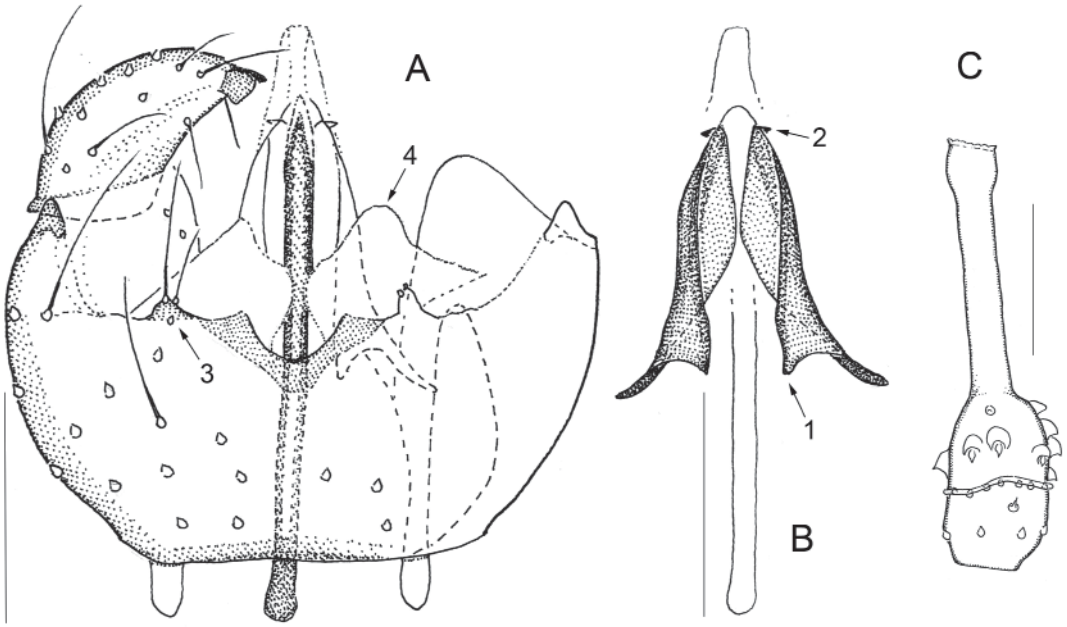

Fig. 18. *Divellepidosis bavarica* sp. nov., holotype, ♂ (ZSM-DIP-42303-E06). **A**. Terminalia, ventral view. **B**. Parameres, with aedeagal apodeme indicated, ventral view. **C**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Other characters

Male

Body length. 1.5 mm.

Head. Eye bridge dorsally 4–5 ommatidia long. Antenna slightly longer than body; circumfila present on flagellomeres 1–8; neck of fourth flagellomere 1.4 × as long as node (Fig. 18C). Palpus 4-segmented, about as long as head height.

Thorax. Anepisternum with 1 seta.

Wing. About as long as body. Length / width ratio 2.7.

Legs. Acropods, to assess structure of claws and empodia, not retained.

Terminalia. Gonocoxal synsclerite broader than long, without separate narrow portion at base; ventroanterior margin clearly contoured, even slightly reinforced, which is unusual in *Divellepidosis*; ventral emargination small, broadly U-shaped, with broad sclerotized margin; protuberances small, abruptly protruding, each with 2 large setae (↓[3], Fig. 18A); processes large, thin-membranous, glabrous (↓[4]); dorsoposterior portions protruding beyond ventroposterior portions. Gonostylus (Fig. 18A) tapered towards apex, with at least 3 plate-like teeth apically, ventralmost largest, inside with 1 long subapical bristle. Aedeagal apodeme (Fig. 18A) markedly longer than gonocoxae, moderately sclerotized, pointed apically. Membranous portions of aedeagus extensive (indicated in Fig. 18A–B).

Divellepidosis hypoxantha (Panelius, 1965)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (640–651bp) of two specimens detailed below are available in BIN BOLD:ACR2287. Search on BOLD's BIN Database retrieved a further 16 matches for this BIN, all as Diptera sp. from Rhineland-Palatinate, Baden-Württemberg and Bavaria, Germany (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; BOLD GBDTA9985-21; ZSM-DIP-42304-A10 • 1 ♂; same data as for preceding but 48°91′17″ N, 8°33′20″ E; elev. 114 m; 26 Apr.–3 May 2020; windthrow of aspen trees; BOLD DTIII8697-22; ZSM-DIP-42476-E04. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′23″ N, 11°18′30″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; ZSM-DIP-42303-C02.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Divellepidosis quadridens (Spungis, 1981)
Fig. 19

Morphological identification

Jaschhof & Jaschhof (2013). See also the next paragraph.

DNA barcode

CO1 sequences (652–659bp) were obtained of two specimens detailed below and allocated to two BINs, BOLD:AEP5411 (ZSM-DIP-42303-G10) and BOLD:AEP5413 (ZSM-DIP-42303-E02). The fact that the two genetic clusters, labeled here A and B, are supported by morphological differences, suggests the presence of two discrete species. In A, the tegmen is strictly parallel-sided (↓[1], Fig. 19A) and sharply pointed apically (↓[2]); in B, it is slightly constricted near the midlength (↓[1], Fig. 19B) and narrowly rounded apically (↓[2]). Also, the gonocoxal ventral emargination of A might be broader and U- rather than V-shaped compared with B (↓[3], Fig. 19A–B), and the undulating sclerotized rim at the inside of the gonocoxal wall is entirely sharply demarcated in A, while it is seemingly interrupted in B (↓[4], Fig. 19A–B). Both characters, outline of the emargination and appearance of the rim, might be interdependent. Since possible effects of individual variation and preparation artefacts cannot be assessed in the absence of further specimens for study, I refrain here from naming the potential sibling species. Also, it remains to be settled through study of the holotype which of the clusters is the genuine *D. quadridens*. Search on BOLD's BIN Database retrieved no further results for these BINs (accessed 27 Aug. 2023).

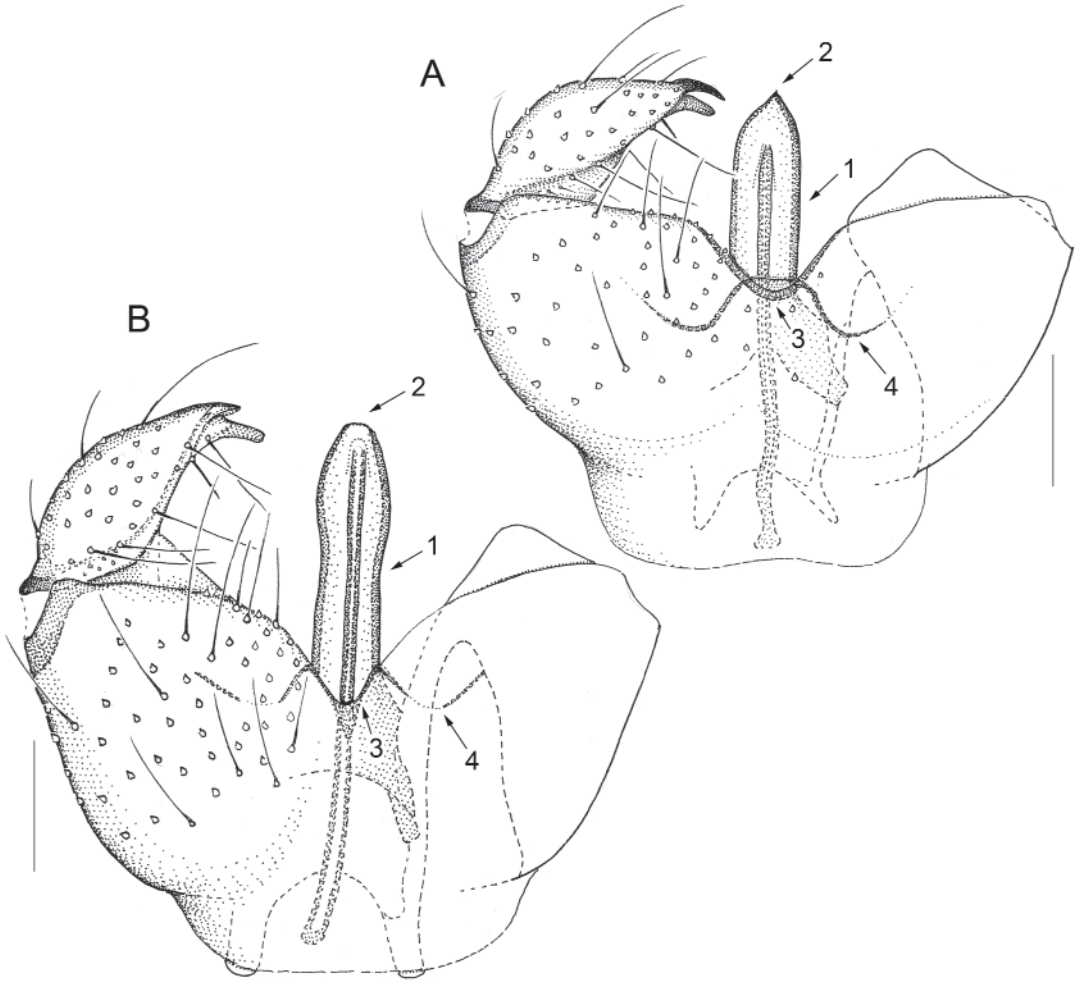

Fig. 19. *Divellepidosis quadridens* (Spungis, 1981). **A**. Terminalia, ventral view, genetic cluster A (ZSM-DIP-42303-G10). **B**. Terminalia, ventral view, genetic cluster B (ZSM-DIP-42303-E02). Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; ZSM-DIP-42303-E01 • 1 ♂; same data as for preceding; BOLD GBDTA9930-21; ZSM-DIP-42303-E02 • 1 ♂; same data as for preceding but 47°94′23″ N, 11°18′30″ E; BOLD GBDTA9962; ZSM-DIP-42303-G10.

Distribution

Germany (new record); Sweden, Latvia (Gagné & Jaschhof 2021).

Divellepidosis taigacola Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′23″ N, 11°18′30″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; ZSM-DIP-42303-C04.

Distribution

Germany (new record); Sweden, Finland (Gagné & Jaschhof 2021).

Genus ***Holoneurus*** Kieffer, 1895

Holoneurus, a poorly known genus close to *Cassidoides* and *Coccopsilis*, comprises nine species in the Nearctic, Neotropical, Palearctic, and Oriental regions (Gagné & Jaschhof 2021). However, the generic affiliation of the four extra-European representatives remains to be verified (Jaschhof & Jaschhof 2013; Jaschhof 2014). Of five species known from Europe, only two may be regarded as properly described. Characteristic features of even the type species, *H. cinctus* Kieffer, 1894, need clarification (Jaschhof & Jaschhof 2013). The genus is here reported from Germany for the first time.

Holoneurus ciliatus Kieffer, 1896

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (641bp) of the specimen listed below is available in BIN BOLD:ACE2212. Search on BOLD's BIN Database retrieved a further two matches for this BIN, both as Cecidomyiidae sp. from Germany (Bavaria) and Belarus (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA9971-21; ZSM-DIP-42303-H07.

Distribution

Germany (new record); France, Sweden, Slovak Republic (Gagné & Jaschhof 2021).

Genus ***Isocolpodia*** Parnell, 1971

Porricondylini with basitarsal spines and 14 male flagellomeres are classified in either *Isocolpodia* or *Stomatocolpodia*, both vaguely defined genera (Jaschhof & Jaschhof 2013, 2020a). *Isocolpodia* is Holarctic in distribution and comprises eight species, of which two occur in Europe (Gagné & Jaschhof 2021). One of the European species was previously recorded from Germany (Jaschhof & Jaschhof 2021b); of the other the first-time record is detailed here.

Isocolpodia unidentata (Marikovskij, 1958)

Morphological identification

Jaschhof & Jaschhof (2020a).

DNA barcode

CO1 sequences (651–668bp) of the eight specimens listed below are available in BIN BOLD:AEO9001. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Munich, Allacher Lohe Nature Reserve; 48°20′06″ N, 11°48′35″ E; elev. 499 m; 23 Jun.–5 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; heathland; BOLD GBDTA10285-21; ZSM-DIP-42307-C01 • 1 ♂; same data as for preceding; BOLD GBDTA10286-21; ZSM-DIP-42307-C02 • 1 ♂; same data as for preceding but 48°19′88″ N, 11°47′54″ E; elev. 502 m; 21 Jul.–4 Aug. 2021; BOLD GBDTA10292-21; ZSM-DIP-42307-C08 • 1 ♂; same data as for preceding; BOLD GBDTA10293-21; ZSM-DIP-42307-C09 • 1 ♂; same data as for preceding; BOLD GBDTA10296-21; ZSM-DIP-42307-C12 •1 ♂; same data as for preceding; BOLD GBDTA10297-21; ZSM-DIP-42307-D01 • 1 ♂; same data as for preceding; BOLD GBDTA10298-21; ZSM-DIP-42307-D02 • 1 ♂; same data as for preceding; GBDTA10299-21; ZSM-DIP-42307-D03.

Distribution

Germany (new record); Sweden, Kazakhstan (Gagné & Jaschhof 2021).

Genus ***Lamellepidosis*** Mamaev, 1990

The genus *Lamellepidosis* previously contained a single species, *L. spungisi* Mamaev, 1990, known from Sweden, Ukraine (Gagné & Jaschhof 2021) and, as documented here, Germany. The finding of a new *Lamellepidosis*, which is described below, may be regarded as one of the most unexpected outcomes of GBOL III:Dark Taxa. The fact that two different *Lamellepidosis* occur in southern Germany may indicate that the main distribution of this genus is in southern Europe, a poorly researched region for mycophagous cecidomyiids.

Lamellepidosis luderbuschensis sp. nov.

urn:lsid:zoobank.org:act:97C537DB-81ED-449E-8280-86F4298EECB3

Fig. 20

Diagnosis

Lamellepidosis luderbuschensis sp. nov. differs from *L. spungisi* in several details of the male terminalia (Fig. 20A). The most obvious difference concerns the gonostylus, whose apex is strongly flattened and pointed in the new species (↓[1]) versus slightly flattened and rounded in *L. spungisi* (Jaschhof & Jaschhof

2017: fig. 9a). Another distinction is that the tegmen of the new species is markedly narrowed towards the apex (↓[2]), whereas that of *L. spungisi* is parallel-sided (Jaschhof & Jaschhof 2017: fig. 9a). A third difference concerns the gonocoxal synsclerite whose ventroposterior portions are broad and blunt-ended in the new species (↓[3]), whereas they are narrower and extended into rounded lobes in *L. spungisi* (Jaschhof & Jaschhof 2017: fig. 9a). Larvae and females of *L. luderbuschensis* are unknown.

Etymology

The specific epithet is derived from the type locality, the Gewann Luderbusch near Malsch in Baden-Württemberg. The Luderbusch emerged as one of the most productive areas for mycophagous cecidomyiids sampled in the course of GBOL III: Dark Taxa, probably because of the outstanding diversity and quality of the natural habitats found there.

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 26 Apr.–3 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; ZSM-DIP-42476-A08.

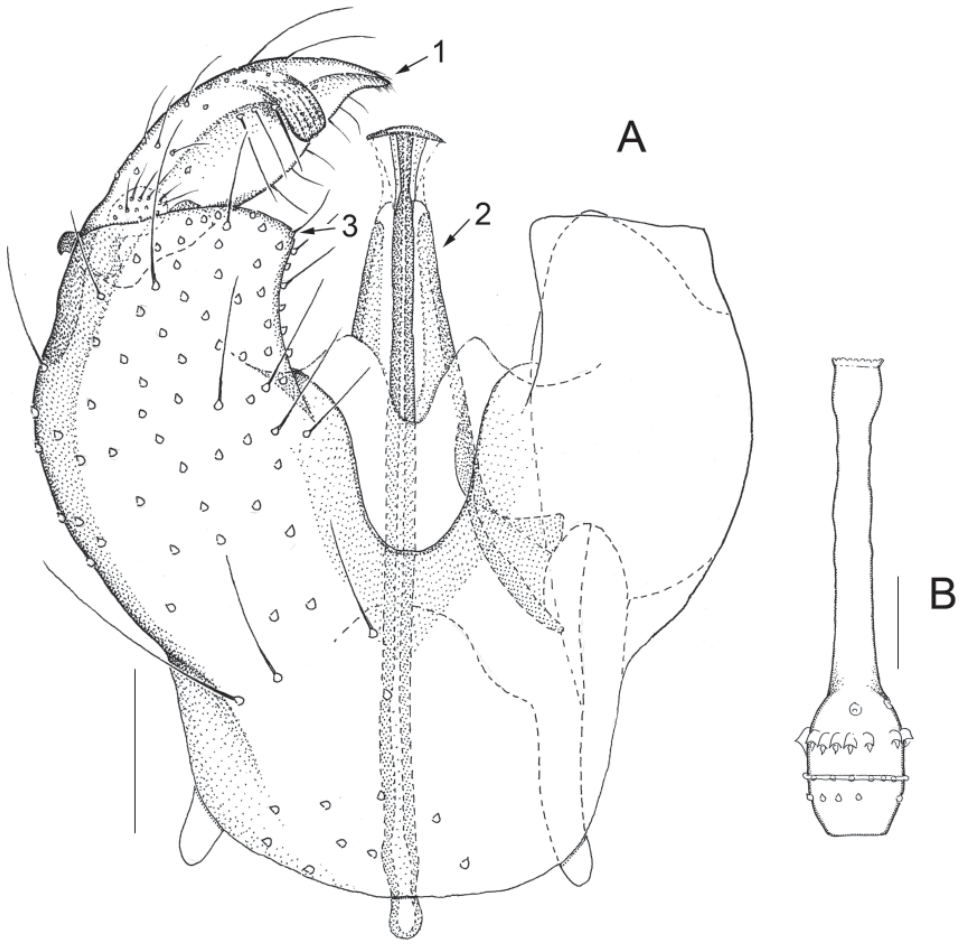

Fig. 20. *Lamellepidosis luderbuschensi* sp. nov., holotype, ♂ (ZSM-DIP-42476-A08). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Paratypes

GERMANY • 1 ♂; same data as for the holotype but 17–24 May 2020; ZSM-DIP-42476-F02 • 1 ♂; same data as for preceding but 48°91′17″ N, 8°33′20″ E; elev. 114 m; windthrow of aspen trees; ZSM-DIP-42476-D09.

Other characters

Male

Body length. 2.0–2.3 mm.

Head. Eye bridge dorsally 3–4 ommatidia long. Antenna longer than body; scape and pedicel brighter than flagellum; 14 flagellomeres; circumfila present on flagellomeres 1–11; neck of fourth flagellomere 2.3 × as long as node (Fig. 20B). Palpus 4-segmented, markedly longer than head height.

Thorax. Both anepisternum and anepimeron sparsely setose.

Wing. Longer than body. Length / width ratio 2.9. Venation as in *L. spungisi* (Jaschhof & Jaschhof 2017).

Legs. Claws crescent-shaped, with 1 large tooth basally. Empodia ¾ as long as claws.

Terminalia (Fig. 20). Gonocoxal synsclerite: ventral emargination U-shaped, with broad sclerotized margin anteriorly; processes large, thin-membranous, glabrous; a large, narrowed setose portion ventroanteriorly. Gonostylus in ventral view 3 × as long as broad, broadest at about midlength; a large plate-like tooth arising from a short process subapicoventrally; outside with setae of various lengths; inside sparsely setose, including 2–3 long subapical bristles. Aedeagal apodeme longer than gonocoxae, moderately sclerotized, brodened apically. Tegminal apex membranous, slightly incised.

Lamellepidosis spungisi Mamaev, 1990

Morphological identification

Jaschhof & Jaschhof (2017).

Material examined

GERMANY – **Bavaria** • 1 ♂; Dammbach, Dammbachtal; 49°85′96″ N, 9°34′89″ E; elev. 368 m; 17 Jun.–2 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; pasture; ZSM-DIP-42471-E10 • 1 ♂; same data as for preceding; ZSM-DIP-42471-F03 • 1 ♂; same data as for preceding; ZSM-DIP-42471-F06.

Distribution

Germany (new record); Sweden, Ukraine (Gagné & Jaschhof 2021).

Genus ***Monepidosis*** Mamaev, 1966

The genus *Monepidosis* has 19 species in the Holarctic region and 12 in Europe (Gagné & Jaschhof 2021). The European species were either reviewed or newly described in recent years (Jaschhof 2016a; Jaschhof & Jaschhof 2013, 2020a), but the rest need taxonomic revision. While the German fauna was previously known to include three *Monepidosis* species (Jaschhof & Jaschhof 2021b), two new additions are documented here.

Monepidosis scepteri Spungis, 2006

Morphological identification

Spungis (2006b).

DNA barcode

CO1 sequences (651–653bp) were obtained of the 11 specimens listed below and allocated to two BINs, BOLD:ACT8511 (ZSM-DIP-42305-A03, from Bavaria) and BOLD:AEO7958 (all other specimens, from Baden-Württemberg). My reexamination of these specimens failed to find morphological evidence in support of the genetic clustering. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further four matches for BOLD:ACT8511, all as Cecidomyiidae sp. from Canada (three matches) and Bulgaria (one).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; BOLD GBDTA9986-21; ZSM-DIP-42304-A11 • 1 ♂; same data as for preceding but 48°91′50″ N, 8°33′19″ E; elev. 113 m; 26 Apr.–3 May 2020; willow scrub; BOLD GBDTA10022-21; ZSM-DIP-42304-D11 • 1 ♂; same data as for preceding but 48°91′28″ N, 8°33′35″ E; elev. 111 m; 17–24 May 2020; willow scrub and reed; BOLD DTIII8545-22; ZSM-DIP-42474-H06 • 1 ♂; same data as for preceding but 48°91′44″ N, 8°33′24″ E; elev. 112 m; 10–17 May 2020; willow/aspen forest and game browsing field; BOLD DTIII8614-22; ZSM-DIP-42475-F04 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 17–24 May 2020; windthrow of willow and aspen trees; BOLD DTIII8701-22; ZSM-DIP-42476-E08 • 1 ♂; same data as for preceding; BOLD DTIII8745-22; ZSM-DIP-42477-A05 • 1 ♂; same data as for preceding; BOLD DTIII8751-22; ZSM-DIP-42477-A11 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′22″ E; elev. 112 m; 26 Apr.–3 May 2020; windthrow of aspen trees; BOLD DTIII8889-22; ZSM-DIP-42478-E06 • 1 ♂; same data as for preceding; BOLD DTIII8896-22; ZSM-DIP-42478-F01. – **Bavaria** • 1 ♂; Upper Bavaria, Rudelzhausen; 48°57′84″ N, 11°86′26″ E; elev. 520 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10073-21; ZSM-DIP-42305-A03.

Distribution

Germany (new record); Sweden, Latvia (Gagné & Jaschhof 2021).

Monepidosis spatulata Spungis, 2006

Morphological identification

Spungis (2006b).

DNA barcode

The CO1 sequence (653bp) of the specimen listed below is available in BIN BOLD:AEI0514. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 17–24 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8705-22; ZSM-DIP-42476-E12.

Distribution

Germany (new record); Sweden, Latvia, Lithuania (Gagné & Jaschhof 2021).

Genus ***Neocolpodia*** Mamaev, 1964

The genus *Neocolpodia* contains three species of chiefly European distribution; only *N. gukasiani* (Mamaev, 1990) extends the generic range into southern Siberia (Gagné & Jaschhof 2021). *Neocolpodia gukasiani* as treated by Jaschhof & Jaschhof (2013) is an aggregate, which even after the separation of *N. ombergensis* Jaschhof & Jaschhof, 2020 comprises two or three discrete species in Sweden, all unnamed (Jaschhof & Jaschhof 2021a). One of these occurs also in Germany (Jaschhof & Jaschhof 2021b). The record of *N. paradoxa* Mamaev, 1964 documented below is the first for Germany; earlier reports rested on misidentification with *N. gukasiani* (Jaschhof & Jaschhof 2021b).

Neocolpodia paradoxa Mamaev, 1964

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 24 Apr.–8 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; ZSM-DIP-42475-G03.

Distribution

Germany (new record); Sweden, Netherlands, Bulgaria, European part of Russia (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021b).

Genus ***Oelandyla*** Jaschhof & Jaschhof, 2020

This monotypic genus was recently introduced for a then unnamed species discovered on the island of Öland, southeastern Sweden (Jaschhof & Jaschhof 2020a). The same species is here shown to occur in southern Germany.

Oelandyla rostrata Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020a).

DNA barcode

The CO1 sequence (640bp) of the specimen detailed below is available in BIN BOLD:AEY8257. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′28″ N, 8°33′35″ E; elev. 111 m; 17–24 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow scrub and reed; BOLD DTIII8554-22; ZSM-DIP-42475-A04. – **Bavaria** • 1 ♂; Lower Franconia, Kolitzheim; 49°92′17″ N, 10°23′42″ E; elev. 229 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-C04 • 1 ♂; Dammbach, Dammbachtal; 49°86′64″ N, 9°32′63″ E; elev. 349 m; 3–17 Jun. 2021; GBOL and

R. Albrecht leg.; Malaise trap; nutrient-poor pasture with fruit trees; ZSM-DIP-42471-C04 • 1 ♂; same data as for preceding; ZSM-DIP-42471-D05 • 1 ♂; same data as for preceding; ZSM-DIP-42471-D07 • 1 ♂; same data as for preceding but 2–16 Jul. 2021; ZSM-DIP-42471-B07 • 1 ♂; same data as for preceding but 49°85′96″ N, 9°34′89″ E; elev. 368 m; 17 Jun.–2 Jul. 2021; pasture; ZSM-DIP-42471-F10.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Genus ***Paneliusia*** Jaschhof, 2013

This genus was recently introduced to accommodate three species with generally similar male terminalia structures, of which two were misplaced in *Porricondyla* and one was unnamed (Jaschhof & Jaschhof 2013). To present knowledge, the geographical distribution of *Paneliusia* is essentially Palearctic, with only a single record published from Pennsylvania, eastern United States (Plakidas 2019). Plakidas's (2019) description leaves no doubt that his species is not *P. aurantiaca* (Panelius, 1965), as he believed, but is either *P. albimanoides* Jaschhof, 2013 or a closely related, unnamed species. Arguments in support of my view are the toothless claws (fig. 129) and the peculiar shape of the gonostylus (fig. 131) depicted by Plakidas (2019). There is indication that *P. albimanoides* as described by Jaschhof & Jaschhof (2013) is an aggregate species in need of further investigation (Jaschhof & Jaschhof 2021b). All three species of *Paneliusia* are present in Germany, with *P. albimanoides* recorded here for the first time.

Paneliusia albimanoides Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen detailed below is available in BIN BOLD:ACP5810. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further five matches for this BIN, all as Cecidomyiidae sp. from Norway (three matches) and Germany (two).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhr, Postlohe, Sattelbogenweiher; 49°26′86″ N, 12°37′88″ E; elev. 382 m; 29 Aug.–10 Sep. 2016; D. Doczkal and J. Voith leg.; Malaise trap; pond edge; ZSM-DIP-42305-A12 •1 ♂; same data as for preceding; ZSM-DIP-42305-B02 • 1 ♂; same data as for preceding; BOLD GBDTA10085-21; ZSM-DIP-42305-B03.

Distribution

Germany (new record); widespread in Palearctic (Gagné & Jaschhof 2021), Nearctic (Pennsylvania)?

Genus ***Parepidosis*** Kieffer, 1913

This genus previously comprised 16 species in the Nearctic, Palearctic, and Oriental regions, although only the 10 species found in Europe may be regarded as revised according to modern standards (Jaschhof & Jaschhof 2013, 2020a, 2021a; Gagné & Jaschhof 2021). A new species of *Parepidosis* described here plus three first-time records raise the number of *Parepidosis* known from Germany to seven (Jaschhof & Jaschhof 2021b).

Parepidosis arcuata Mamaev, 1964

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652–653bp) of three specimens detailed below are available in BIN BOLD:ADM6212. Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Belarus (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, NE of Kieswerk Glaser; 48°54′52″ N, 8°18′46″ E; 27 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; beech log in forest clearing; BOLD GBDTA10014-21; ZSM-DIP-43304-D03. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; BOLD GBDTA9894-21; ZSM-DIP-42303-B02 • 1 ♂; Upper Palatinate, Bodenwöhrer Forst; 49°26′87″ N, 12°35′25″ E; elev. 390 m; 7–29 Aug. 2016; D. Doczkal and J. Voith leg.; Malaise trap; sandy edge of pine forest; ZSM-DIP-42304-G06 • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 27 Jun.–12 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; BOLD DTIII8576-22; ZSM-DIP-42475-C02.

Distribution

Germany (new record); widespread in Europe, Uzbekistan (Gagné & Jaschhof 2021).

Parepidosis lobata sp. nov.
urn:lsid:zoobank.org:act:1EE8B962-1C56-4661-A346-3F8C41D39A37
Fig. 21

Diagnosis

Morphology

The male of *P. lobata* sp. nov. is characterized by the gonostylus whose thick basal portion extends apicodorsally into an elongate-subtriangular process (↓[1], Fig. 21A), and by the H-shaped tegmen whose lateral pillars are markedly bent dorsad beyond the cross connection (↓[2], Fig. 21A). Larvae and females of the new species are unknown.

DNA barcode

CO1 sequences (642–652bp) were obtained of four paratype specimens detailed below and allocated to three different BINs: BOLD:ADW4641 (specimen ZSM-DIP-42305-E05), BOLD:AEO7433 (ZSM-DIP-42306-A08), and BOLD:AEE7552 (ZSM-DIP-42306-G02 and ZSM-DIP-42306-G07). Morphological evidence in support of the genetic clustering was not found (see the remarks below). Search on BOLD's BIN Database retrieved a further match for BIN BOLD:AEE7552, as Cecidomyiidae sp. from Bavaria, Germany (accessed 27 Aug. 2023).

Etymology

The Latin adjective '*lobata*', for 'lobate', refers to the peculiar structure of the gonostylus.

Type material

Holotype

GERMANY • ♂; Bavaria, Lower Bavaria, Rain; 48°64′61″ N, 11°01′89″ E; elev. 429 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-G09.

Paratypes

GERMANY – **Bavaria** • 1 ♂; Deggendorf; 48°84′01″ N, 12°96′62″ E; elev. 377 m; 14 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10239-21; ZSM-DIP-42306-G02 • 1 ♂; same data as for preceding; ZSM-DIP-42306-G03 • 1 ♂; same data as for preceding; BOLD GBDTA10244-21; ZSM-DIP-42306-G07 • 1 ♂; Dammbach, Dammbachtal; 49°86′64″ N, 9°32′63″ E; elev. 349 m; 17 Jun.–2 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; nutrient-poor pasture with fruit trees; ZSM-DIP-42472-D06. – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 21–28 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA10123-21; ZSM-DIP-42305-E05 • 1 ♂; same data as for preceding; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; windthrow of birch trees; BOLD GBDTA10173-21; ZSM-DIP-42306-A08.

Other characters

Male

Body length. 1.5–2.0 mm.

Head. Eye bridge dorsally 3–4 ommatidia long. Antenna markedly longer than body; scape and pedicel brighter than flagellum; circumfila present on flagellomeres 1–13; neck of fourth flagellomere 2.0–2.2 × as long as node (Fig. 21B). Palpus 4-segmented, slightly longer than head height.

Thorax. Scutal setae sparse. Anepisternal setae 0–4.

Wing. Longer than body. Length / width ratio 2.9–3.2.

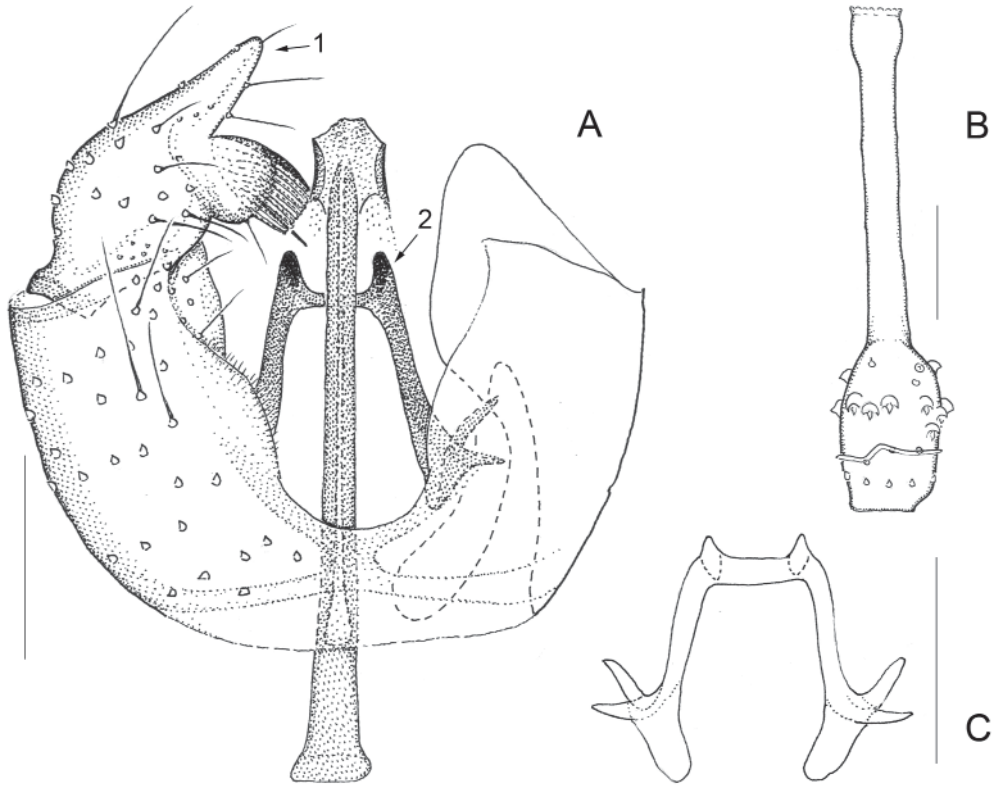

Fig. 21. *Parepidosis lobata* sp. nov. **A**. Holotype, ♂, terminalia, ventral view (ZSM-DIP-42306-G09). **B**. Holotype, ♂, fourth flagellomere, lateral view. **C**. Paratype, ♂, parameres, ventral view, variation (ZSM-DIP-42306-G02). Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Legs. Claws with large tooth basally. Empodia ⅓ as long as claws.

Terminalia (Fig. 21A). Gonocoxal synsclerite: ventral emargination deeply U-shaped, reinforced basally; setose portion below emargination very short; anterior margin membranous, of varying outline. Gonostylus: medial bulge subglobular, with 2–3 ordinary setae and 1 long bristle below pectinate tooth. Aedeagal apodeme markedly longer than gonocoxae, moderately sclerotized; both base and apex broadened, apical broadening subrectangular, slightly sclerotized; ducts of accessory glands evident (not illustrated).

Remarks

The new species exhibits morphological variation to the same, normal extent as found in other *Parepidosis* (Jaschhof & Jaschhof 2013). The confusing thing about *P. lobata* sp. nov. is that, in slide-mounted specimens examined ventrally, the length of the tegminal processes varies depending on how strongly the tegminal apex is bent dorsally under the pressure of the cover slip (Fig. 21A, C).

Parepidosis peculiaris Mamaev, 1966

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′61″ N, 8°33′18″ E; elev. 111 m; 12–26 Apr. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of birch trees; ZSM-DIP-42304-A12.

Distribution

Germany (new record); Sweden, Latvia, European part of Russia (Gagné & Jaschhof 2021).

Parepidosis venustior Gagné, 2004

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen detailed below is available in BIN BOLD:AEY3032. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof, W of Goasl; elev. 712 m; 47°94′15″ N, 11°18′21″ E; 9–23 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; ZSM-DIP-42472-B09 • 1 ♂; same data as for preceding; ZSM-DIP-42472-B11 • 1 ♂; Spessart, Rohrbrunner Forst, Rohrberg Nature Reserve; 49°89′35″ N, 9°42′48″ E; elev. 531 m; 3–18 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; oak forest; ZSM-DIP-42473-A07 • 1 ♂; same data as for preceding but 49°89′42″ N, 9°42′50″ E; elev. 503 m; BOLD DTIII8411-22; ZSM-DIP-42473-E03.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Genus ***Parvovirga*** Jaschhof, 2013

This genus contains two species originally described from Sweden (Jaschhof & Jaschhof 2013), of which one was subsequently reported from Estonia and South Korea (Gagné & Jaschhof 2021). The same species is here shown for the first time to occur in Germany. Findings of *Parvovirga* in nature are exceptional events.

Parvovirga latostylata Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652bp) of two specimens detailed below are available in BIN BOLD:AEO7393. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 17–24 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8749-22; ZSM-DIP-42477-A09. – **Bavaria** • 1 ♂; Spessart, Rohrbrunner Forst, Rohrberg Nature Reserve; 49°89′35″ N, 9°42′48″ E; elev. 531 m; 3–18 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; oak forest; ZSM-DIP-42473-A05 • 1 ♂; same data as for preceding but 49°89′31″ N, 9°42′27″ E; elev. 503 m; BOLD DTIII8401-22; ZSM-DIP-42473-D05.

Distribution

Germany (new record); Sweden, Estonia, South Korea (Gagné & Jaschhof 2021).

Genus ***Porricondyla*** Rondani, 1840

With 79 species extant in the world, including seven species named in the present paper, *Porricondyla* is the largest genus of Porricondylinae (Gagné & Jaschhof 2021; de Almeida Garcia *et al.* 2023c). The bulk of species were described from the Palearctic region, especially Europe, and only a few from all other regions but the Afrotropics. The 39 species known from Europe were either reviewed or newly described in recent years (Jaschhof & Jaschhof 2013, 2020a). Even so, gaps in our knowledge of European *Porricondyla* persist. For instance, while *Porricondyla colpodioides* Mamaev, 1963 sensu Jaschhof & Jaschhof (2013) was previously discovered to be an unresolved aggregate of species (Jaschhof & Jaschhof 2021a), further cases of hidden diversity were revealed only by the present project (see below). Also, there is no doubt that a number of new *Porricondyla* remain to be found, especially in those parts of Europe that have never been methodically surveyed for porricondylines. The German fauna sets a good example here. Prior to the present study there were German records of six *Porricondyla*, but now there is evidence of 31, including 13 new species. While seven of the new species are described below, the rest remain unnamed for the time being because the specimens at hand are insufficient for taxonomic description.

Porricondyla acutistylata sp. nov.
urn:lsid:zoobank.org:act:EFBAACCE-1703-484C-BF57-1F2133CE4B98
Fig. 22

Diagnosis

Morphology

The gonostylar tooth of *P. acutistylata* sp. nov. is comb-shaped, i.e., consists of numerous individual spines with a common, conjunctive base, which places this species in subdivision A of Jaschhof & Jaschhof's (2013) intrageneric classification. Within that subdivision, the new species is characterized by a set of terminalia characters, as follows (Fig. 22A). The gonostylus is both markedly bent and tapered towards the apex (↓[1]); the long, slender and for the most part moderately sclerotized parameres have conspicuously pale, strongly bent apices (↓[2]); and the large, broadly rounded gonocoxal processes are completely membranous (↓[3]). Larvae and females of the new species are unknown.

DNA barcode

The CO1 sequence (652bp) of the holotype specimen is available in BIN BOLD:AER2210. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Etymology

The specific name, an adjective, means 'with pointed gonostylus'.

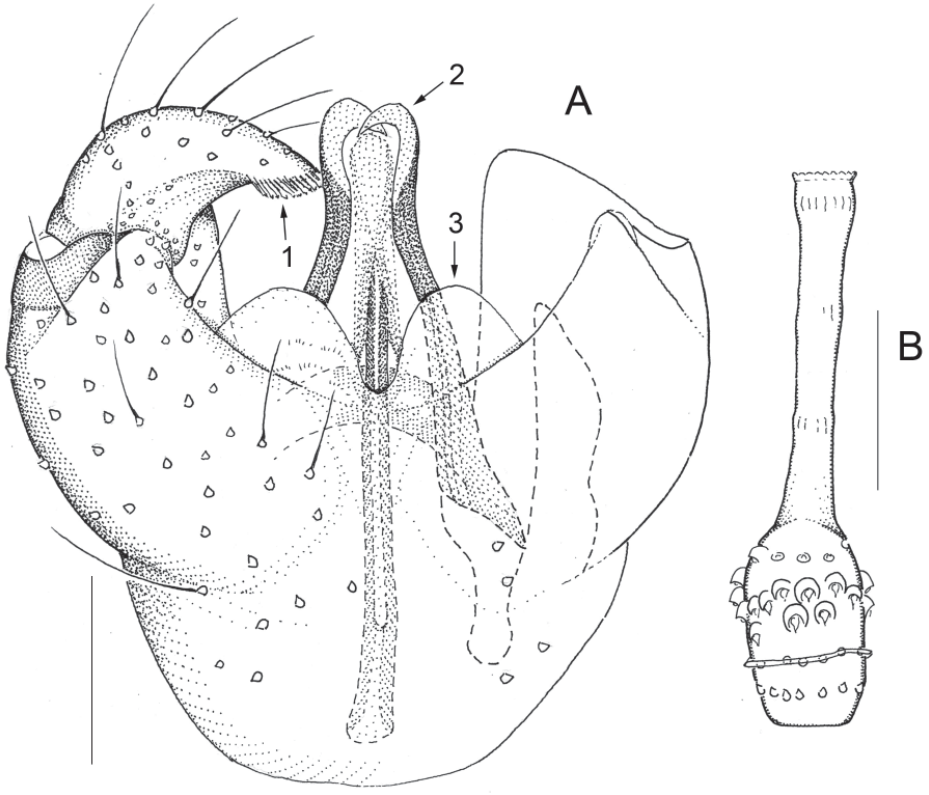

Fig. 22. *Porricondyla acutistylata* sp. nov., holotype, ♂ (ZSM-DIP-42303-C06). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA9910-21; ZSM-DIP-42303-C06.

Other characters

Male

Body length. 2.0 mm.

Head. Eye bridge dorsally 1–2 ommatidia long. Antenna markedly longer than body; scape and pedicel brighter than flagellum; circumfila present on flagellomeres 1–14; neck of fourth flagellomere 1.8× as long as node (Fig. 22B). Palpus concealed in only specimen available for study.

Thorax. No scutal windows. Pronotal setae 4, anepisternal setae 0, anepimeral setae 7.

Wing. Markedly longer than body. Length / width ratio 2.8.

Legs. Foreleg with femur 0.9× length of tibia, T_2 not retained. Acropods not retained.

Terminalia (Fig. 22A). Gonocoxal synsclerite with subtriangular protuberances ventroapically; ventral emargination very broadly U-shaped; a large, narrowed portion anteriorly with only a few, mostly lateral setae; anterior margin broadly rounded. Parameres with unusually broad transverse bridge subbasally. Aedeagal apodeme including its extensive membranous apex as long as gonocoxae, for the most part moderately sclerotized; ducts of accessory glands evident (not illustrated).

Porricondyla clancula Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013). A specimen of *Porricondyla* examined here differs from *P. clancula* in both the CO1 sequence (BIN BOLD:AEO7197) and male terminalia structures, notably the gonostylus, which is slightly more convex outside and pointed apically, and the gonocoxal processes, which are only slightly bent. My reexamination of extra-German specimens revealed this morphotype, labeled here *Porricondyla* sp. MJDE1, to be present in Sweden also (unpublished data). Search on BOLD's BIN Database retrieved no further result for BOLD:AEO7197. See further remarks under *P. rufescens*.

DNA barcode

CO1 sequences (644–652bp) of the five specimens listed below are available in BIN BOLD:ACP4789. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further seven matches for this BIN, all as Cecidomyiidae sp. from Germany (one match), Belarus (four), and Bulgaria (two).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Bavaria, Rudelzhausen; 48°57′84″ N, 11°86′26″ E; elev.520 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10065-21; ZSM-DIP-42304-H06 • 1 ♂; same data as for preceding; BOLD GBDTA10067-21; ZSM-DIP-42304-H08 • 1 ♂; same data as for preceding; BOLD GBDTA10068-21; ZSM-DIP-42304-H09 • 1 ♂; same data as for preceding; BOLD GBDTA10069-21; ZSM-DIP-42304-H10 • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′86″ N, 11°18′62″ E; 20 Mar.–24 Apr. 2020; GBOL leg.; Malaise trap; nutrient-poor meadow; BOLD DTIII8454-22; ZSM-DIP-42473-H10.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Porricondyla diversicornis Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020a).

DNA barcode

The CO1 sequence (651bp) of the specimen listed below is available in BIN BOLD:AEO7198. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhrer Forst; 49°26′87″ N, 12°35′25″ E; elev. 390 m; 7–29 Aug. 2016; D. Doczkal and J. Voith leg.; Malaise trap; sandy edge of pine forest; BOLD GBDTA10052-21; ZSM-DIP-42304-G05.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Porricondyla gemina Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020a).

DNA barcode

CO1 sequences (652–653bp) of the two specimens listed below are available in BIN BOLD:AEY3372. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′20″ N, 8°33′26″ E; elev. 112 m; 10–17 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; windthrow of willow and aspen trees; BOLD DTIII8852-22; ZSM-DIP-42478-B05 • 1 ♂; same data as for preceding but 48°91′24″ N, 8°33′51″ E; elev. 118 m; 10–17 May 2020; windthrow of beech trees; BOLD DTIII8764-22; ZSM-DIP-42477-B12.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Porricondyla insolita sp. nov.
urn:lsid:zoobank.org:act:CDC57B85-6236-4A2A-9373-0112DBC63E8F
Fig. 23

Diagnosis

This small-size *Porricondyla* is distinguished by male terminalia characters, as follows. The unusually small gonocoxal ventral emargination forms an elongate, narrow U (↓[1], Fig. 23A). The gonostylus, which in ventral view looks narrow and elongate, is strongly flattened dorsoventrally and bears apically a large, plate-like tooth (↓[2], Fig. 23A). The tusk-shaped parameres, which are generally similar to those found in other *Porricondyla*, fall out of the ordinary in that they are linked with each other on the dorsal side through a conical membranous structure (↓[3], Fig. 23C). Larvae and females of *P. insolita* sp. nov. are unknown.

Differential diagnosis

The basic construction of the male terminalia in *P. insolita* sp. nov. is similar to that in *P. pallidigenae* Jaschhof & Jaschhof, 2020, which makes it likely that both species are closely related. In distinction from *P. insolita*, the gonostylar body of *P. pallidigenae* is thicker, the gonostylar tooth is serrate, the gonocoxal emargination is shallow and much broader, and the gonocoxal processes are largely membranous (Jaschhof & Jaschhof 2020a: fig. 42).

Etymology

The Latin adjective '*insolita*' means 'unusual', an allusion to the fact that this is a rather untypical *Porricondyla*.

Type material

Holotype

GERMANY • ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42303-H01.

Paratypes

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Esselbach; 49°86′79″ N, 9°51′60″ E; elev. 377 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42304-H03 • 1 ♂; Lower Franconia, Rothenbuch; 49°96′34″ N, 9°38′91″ E; elev. 346 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-B09 • 1 ♂; Lower Franconia, Rimpar; 49°87′41″ N, 9°96′32″ E; elev. 317 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-C11 • 1 ♂; Lower Franconia, Kolitzheim; 49°92′17″ N, 10°23′42″ E; elev. 229 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-B08 • 1 ♂; same data as for preceding; ZSM-DIP-42306-B10 • 1 ♂; same data as

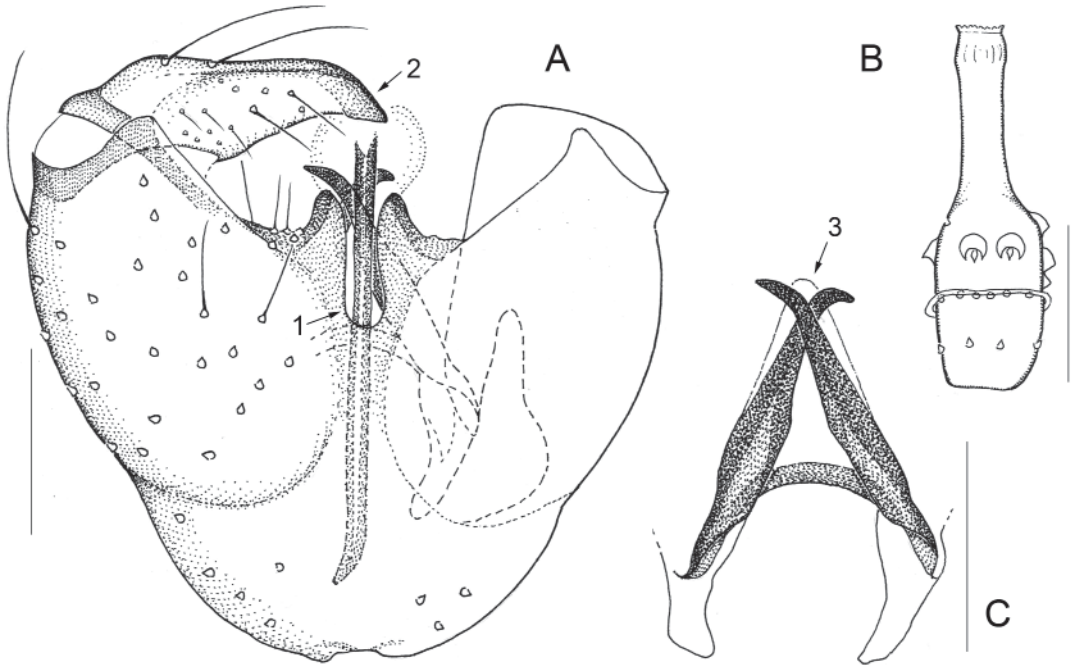

Fig. 23. *Porricondyla insolita* sp. nov., holotype, ♂ (ZSM-DIP-42303-H01). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. **C**. Parameres, ventral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

for preceding; ZSM-DIP-42306-B11 • 1 ♂; Dammbach, Dammbachtal; 49°86′64″ N, 9°32′63″ E; elev. 349 m; nutrient-poor pasture with fruit trees; 3–17 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; ZSM-DIP-42471-C11.

Other characters

Male

Body length. 1.2–1.4 mm.

Head. Eye bridge dorsally 2–3 ommatidia long. Antenna about as long as body; scape and pedicel concolorous with flagellum; circumfila present on flagellomeres 1–7; neck of fourth flagellomere as long as node (Fig. 23B). Palpus 4-segmented, about as long as head height, apical segment longest of all.

Thorax. No scutal windows. Pronotal setae 2–3, anepisternal setae 0–1, anepimeral setae 0–2.

Wing. Slightly longer than body. Length / width ratio 3.0–3.1.

Legs. Foreleg with femur 0.9× length of tibia, tibia 1.4× length of T_2 (see the remark below). Claws toothless. Empodia broad, as long as claws.

Terminalia. Gonocoxal synsclerite (Fig. 23A): ventral emargination with broad, darkly pigmented margin; processes small, rounded apically, moderately sclerotized; a large, narrowed portion anteriorly with only a few, mostly lateral setae; anterior margin broadly rounded. Gonostylus (Fig. 23A): outside slightly convex, with large setae; inside slightly concave, with finer setae. Parameres (Fig. 23C) crossing each other apically, with narrow transverse bridge subbasally. Aedeagal apodeme (Fig. 23A) shorter than gonocoxae, moderately sclerotized; apex covered by large, inflated membranous cap (presumably the apical portion of aedeagus); ducts of accessory glands evident (not illustrated).

Remark

In *P. pallidigenae*, the fore tibia is 1.5× the length of T_2, not 0.6 as erroneously quoted by Jaschhof & Jaschhof (2020a), thus similarly long as in *P. insolita* sp. nov.

Porricondyla lata Mamaev, 1965

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Dammbach, Dammbachtal; 49°86′64″ N, 9°32′63″ E; elev. 349 m; 17 Jun.–2 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; nutrient-poor pasture with fruit trees; ZSM-DIP-42472-D03.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Porricondyla leacheana (Walker, 1856)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652–699bp) of the six specimens listed below are available in BIN BOLD:AEK9974. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Moos, Isar estuary; 48°79′16″ N, 12°96′84″ E; elev. 312 m; 20 May–2 Jun. 2021; GBOL and R. Albrecht leg.; window trap; softwood floodplain forest; BOLD GBDTA10316-21; ZSM-DIP-42307-E08 • 1 ♂; same data as for preceding; BOLD GGBDTA10317-21; ZSM-DIP-42307-E09 • 1 ♂; Spessart, Rohrbrunner Forst, Rohrberg Nature Reserve; 49°89′31″ N, 9°42′27″ E; elev. 503 m; 3–18 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; oak forest; BOLD DTIII8366-22; ZSM-DIP-42473-A06 • 1 ♂; same data as for preceding but 49°89′42″ N, 9°42′50″ E; elev. 540 m; BOLD DTIII8409-22; ZSM-DIP-42473-E02 • 1 ♂; same data as for preceding; BOLD DTIII8410-22; ZSM-DIP-42473-E01 • 1 ♂; same data as for preceding; BOLD DTII8412-22; ZSM-DIP-42473-E04.

Distribution

Germany (new record); UK, Sweden, Latvia, Austria, European part of Russia (Gagné & Jaschhof 2021).

Porricondyla macrodon Mamaev, 1965

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652bp) of the three specimens listed below are available in BIN BOLD:AEK4985. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 24 Apr.–8 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD DTIII8498-22; ZSM-DIP-42474-D07 • 1 ♂; same data as for preceding but 20 Jun.–12 Jul. 2020; BOLD GBDTA9938-21; ZSM-DIP-42303-E10 • 1 ♂; same data as for preceding; BOLD GBDTA9939-21; ZSM-DIP-42303-E11.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Porricondyla neglecta Mamaev, 1965

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (651bp) of the specimen listed below is available in BIN BOLD:ACG3432. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further two matches for this BIN, as Cecidomyiidae sp. from Germany (one match) and Belarus (one).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′15″ N, 11°18′26″ E; 8 May–5 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA9913-21; ZSM-DIP-42303-C09.

Distribution

Germany (new record); widespread in Europe (Gagné & Jaschhof 2021).

Porricondyla oblonga sp. nov.
urn:lsid:zoobank.org:act:3326B979-98CB-47A2-AC91-E3DD3DC19974
Fig. 24

Diagnosis

Morphology

Porricondyla oblonga sp. nov. belongs to the species group around *P. nigripennis* (Meigen, 1830), which also comprises *P. gemina* (Jaschhof & Jaschhof 2020a) and two as yet unnamed species (unpublished data). Several characters once thought to be specific to *P. nigripennis* are actually found in all these species, notably the conspicuously banded abdomen and the scutum with both presutural and prescutellar windows (Jaschhof & Jaschhof 2013: fig. 16). Also, males have similar-looking terminalia that interspecifically differ merely in subtle details. *Porricondyla oblonga* is distinguished as follows (Fig. 24A): the gonostylus is slightly elongated, thus longer than in the other species (↓[1]), the gonocoxal processes bear fairly large microtrichia, which are most numerous on the dorsal side (↓[2]), and the narrowed anterior portion of the gonocoxal synsclerite is longer than in the sibling species (↓[3]). Larvae and females are unknown.

DNA barcode

The CO1 sequence (653bp) of the paratype specimen is available in BIN BOLD:ACP5893. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further three matches for this BIN, as Diptera sp. from Germany (two matches) and Cecidomyiidae sp. from Norway (one match).

Etymology

The specific epithet, '*oblonga*', is the Latin adjective for 'elongate', with reference to the shape of the gonostylus.

Type material

Holotype

GERMANY • ♂; Bavaria, Dammbach, Dammbachtal; 49°85′96″ N, 9°34′89″ E; elev. 368 m; 17 Jun.–2 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; pasture; ZSM-DIP-42471-F08.

Paratype

GERMANY • 1 ♂; Bavaria, Munich, Botanical Garden; 48°16′46″ N, 11°49′49″ E; elev. 516 m; 21 Jun.–1 Jul. 2020; GBOL and R. Albrecht leg.; Malaise trap; BOLD GBDTA10300-21; ZSM-DIP-42307-D04.

Other characters

Male

Body length. 2.0 mm.

Head. Eye bridge dorsally 3 ommatidia long. Antenna longer than body; scape and pedicel concolorous with flagellum; circumfila present on flagellomeres 1–13; neck of fourth flagellomere 1.4× as long as

node (Fig. 24B). Palpus 4-segmented, markedly longer than head height, apical segment almost twice as long as preceding segment.

Thorax. Pronotal setae 6–8, anepisternal setae 2–4, anepimeral setae 5–8.

Wing. Markedly longer than body. Length / width ratio 2.8.

Legs. Foreleg with femur 0.9 × length of tibia, tibia 1.4 × length of T_2. Claws with 1 large and 2–3 much smaller teeth basally. Empodia broad, slightly longer than claws.

Terminalia (Fig. 24A). Gonocoxal synsclerite: setae confined to ventrolateral and dorsal portions; ventral emargination with broad, darkly pigmented margin; dorsal apodemes project only slightly beyond ventroanterior margin. Gonostylus: pectinate tooth large, dented in the middle, which results in a sinuous margin; inside glabrous except for 5–6 long bristles inserted below tooth. Parameres similar to these found in the sibling species, with broad, slightly bent transverse bridge subbasally. Aedeagal apodeme as long as gonocoxae, strongly sclerotized, slightly broadened apically.

Remarks

In the original description of *P. gemina* it was stated that the gonostylar pectinate tooth follows the curve of the gonostylar body, i.e., is evenly rounded (Jaschhof & Jaschof 2020a: 170, fig. 34). This observation is incorrect, as my examination of additional material has now revealed. In fact, the gonostylar tooth is dented in the middle, in the same way as in both *P. nigripennis* and *P. oblonga* sp. nov.

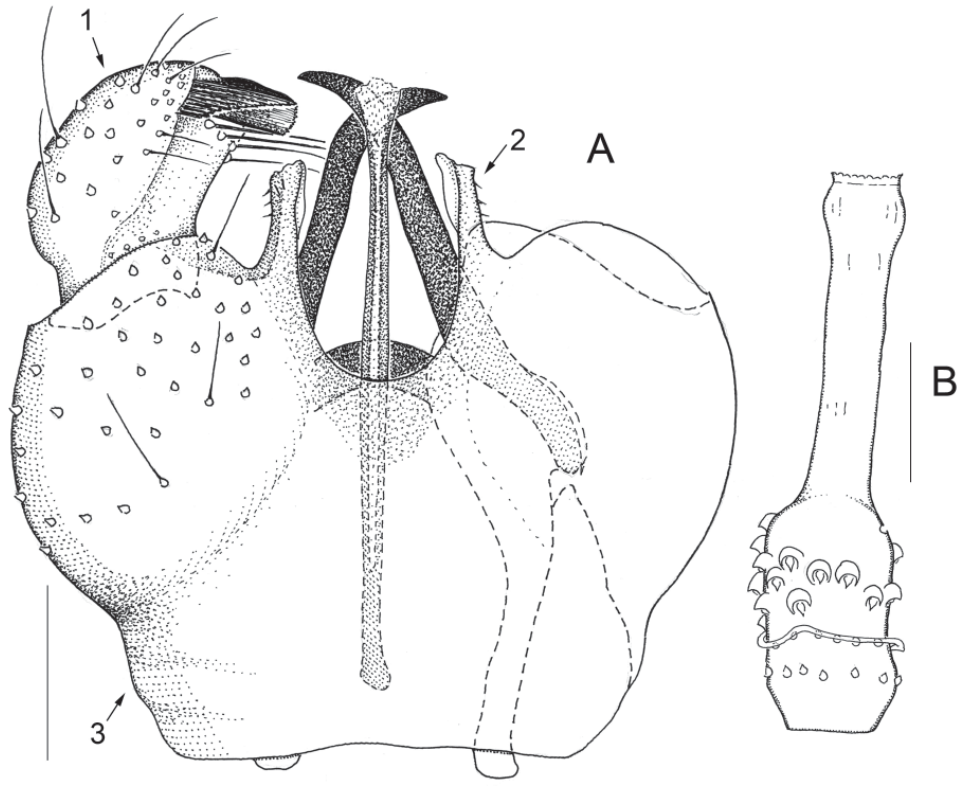

Fig. 24. *Porricondyla oblonga* sp. nov., holotype, ♂ (ZSM-DIP-42471-F08). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Porricondyla ornata sp. nov.
urn:lsid:zoobank.org:act:DD73BA69-FB6C-4D17-818D-2E54E041EA17
Fig. 25

Diagnosis

Males of this new *Porricondyla* have large, semicircular lobes on both sides of the gonocoxal ventral emargination (↓[1], Fig. 25A). The lobes, which bear setae of various sizes, occur in addition to the small, completely membranous gonocoxal processes (↓[2], Fig. 25A). A further peculiarity is that the parameres are bifid apically, which in ventral view is not always easy to see (see the section on other male characters). Larvae and females of *P. ornata* sp. nov. are unknown.

Differential diagnosis

Both characters described above as diagnostic of *P. ornata* sp. nov. are also known from other *Porricondyla*, but do not occur together. Semicircular gonocoxal lobes are also found in *P. ussuriorum* Mamaev & Zaitzev, 1996, where they appear smaller and situated farther afield from the gonocoxal emargination (Mamaev & Zaitzev 1996: fig. 26). *Porricondyla ussuriorum*, a Far East Russian species known only from the holotype male, was described to be conspicuously small (body length 1.2 mm) and to have the parameres single-pointed and the gonostylus excavated interiorly (Mamaev & Zaitzev 1996: fig. 14). Bifid parameres were described as typical of *P. ottenbyensis* Jaschhof & Jaschhof, 2020, a species found in one place in southeastern Sweden (Jaschhof & Jaschhof 2020a). In distinction from *P. ornata*, *P. ottenbyensis* lacks gonocoxal lobes, the gonocoxal processes are much larger, and the gonostylus is much narrower (Jaschhof & Jaschhof 2020a: fig. 41).

Etymology

The name '*ornata*', the Latin adjective for 'decorated', is an allusion to the lobe-bearing gonocoxae found in this species.

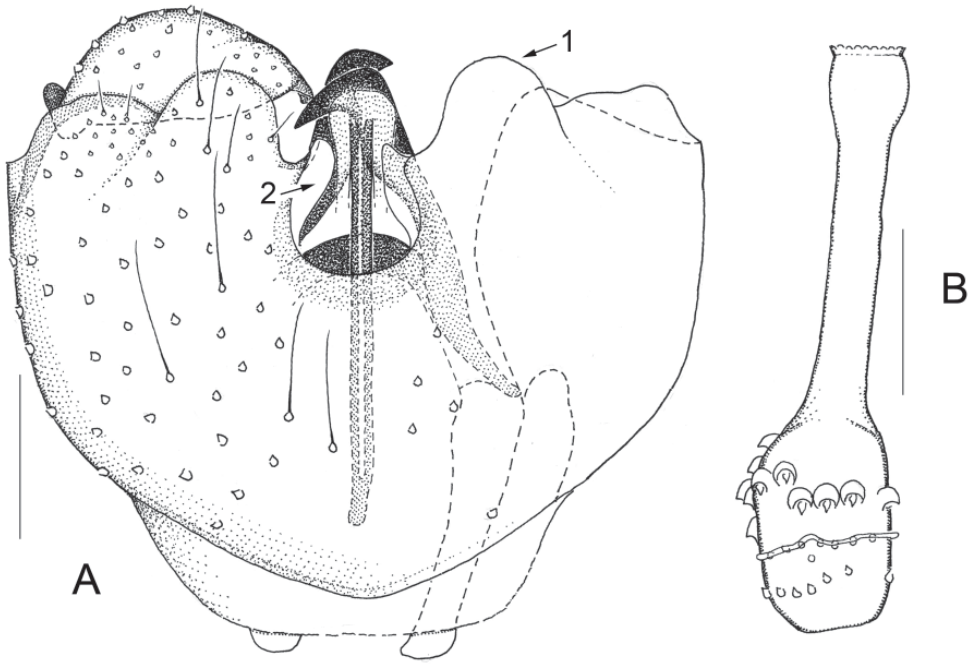

Fig. 25. *Porricondyla ornata* sp. nov., holotype, ♂ (ZSM-DIP-42305-E11). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Type material

Holotype

GERMANY • ♂; Bavaria, Swabia, Esterholz; 48°64′17″ N, 11°01′88″ E; elev. 485 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-E11.

Paratypes

GERMANY • 1 ♂; same data as for the holotype; ZSM-DIP-42305-E12 • 1 ♂; same data as for preceding; ZSM-DIP-42305-F01.

Other characters

Male

Body length. 2.0 mm.

Head. Eye bridge dorsally 4–5 ommatidia long. Antenna longer than body; scape and pedicel brighter than flagellum; circumfila present on flagellomeres 1–12; neck of fourth flagellomere 1.7× as long as node (Fig. 25B). Palpus 4-segmented, slightly longer than head height, apical segment longest of all.

Thorax. Pronotal setae 1–2, anepisternal setae 1–2, anepimeral setae 3–4.

Wing. Slightly longer than body. Length / width ratio 2.4.

Legs. Foreleg: femur and tibia equally long, T_2 not retained. Acropods, to assess structure of claws and empodia, not retained.

Terminalia (Fig. 25A). Gonocoxal synsclerite massive; densely setose ventrally except for a glabrous, narrowed portion anteriorly; ventral emargination with broad, darkly pigmented margin; dorsal apodemes project only slightly beyond ventroanterior margin. Gonostylus small in relation to gonocoxa, about twice as long as thick in ventral view, apparently flattened dorsoventrally, with fairly small, plate-like tooth apically. Parameral apices bifid, which is not apparent in the holotype, though evident in the paratypes; subapical portions markedly dilated. Aedeagal apodeme shorter than gonocoxae, strongly sclerotized; apex slightly broadened due to junction with accessory gland ducts, the latter pigmented and thus unusually distinct.

Porricondyla pallidigenae Jaschhof & Jaschhof, 2020

Morphological identification

Jaschhof & Jaschhof (2020a).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42303-H02 • 1 ♂; same data as for preceding; ZSM-DIP-42303-H05 • 1 ♂; same data as for preceding; ZSM-DIP-42303-H06. – **Bavaria** • 1 ♂; Upper Palatinate, Bodenwöhrer Forst; 49°26′87″ N, 12°35′25″ E; elev. 390 m; 7–29 Aug. 2016; D. Doczkal and J. Voith leg.; Malaise trap; sandy edge of pine forest; ZSM-DIP-42304-G11 • 1 ♂; Lower Franconia, Rimpar; 49°85′93″ N, 9°95′34″ E; elev. 279 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42306-F07.

Distribution

Germany (new record); Sweden (Gagné & Jaschhof 2021).

Porricondyla petrophila Mamaev, 1986

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (642–652bp) were obtained of the four specimens listed below and allocated to two different BINs, BOLD:ADZ9244 (specimens ZSM-DIP-42306-E11 and ZSM-DIP-42473-G03) and BOLD:ADM5312 (ZSM-DIP-42305-H05 and ZSM-DIP-42305-H06). In terms of male morphology, BOLD:ADZ9244 differs from BOLD:ADM5312 in that the eye bridge is slightly shorter, the flagellomeral necks are slightly shorter, the gonocoxal processes are somewhat broader, and the ventral bulge of the gonostylus is less prominent. BOLD:ADM5312 is identical with *P. petrophila* as described by Jaschhof & Jaschhof (2013) on the basis of specimens from Sweden. More material needs to be studied in order to substantiate the variation observed here. Search on BOLD's BIN Database retrieved a further match for BIN BOLD:ADM5312, as Cecidomyiidae sp. from Belarus (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′17″ N, 8°33′20″ E; elev. 114 m; 10 May 2020; D. Dozckal and K. Grabow leg.; Malaise trap; BOLD DTIII8435-22; ZSM-DIP-42473-G03. – **Bavaria** • 1 ♂; Hauptsmoor E of Bamberg; 49°91′64″ N, 10°93′75″ E; elev. 281 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10159-21; ZSM-DIP-42305-H05 • 1 ♂; same data as for preceding; BOLD GBDTA10160; ZSM-DIP-42305-H06 • 1 ♂; Lower Franconia, Rimpar; 49°85′93″ N, 9°95′34″ E; elev. 279 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10224-21; ZSM-DIP-42306-E11.

Distribution

Germany (new record); Sweden, Turkmenistan, Far East of Russia (Gagné & Jaschhof 2021).

Porricondyla pilosa (Mamaev & Zaitzev, 1996)
Fig. 26C

Morphological identification

Jaschhof & Jaschhof (2013). Note also the peculiar shape of the gonocoxal processes (Fig. 26C), a character not mentioned earlier.

DNA barcode

CO1 sequences (650–651bp) of two specimens detailed below are available in BIN BOLD:AEO7193. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Rauhenebrach; 49°91′82″ N, 10°56′03″ E; elev. 366 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-A06 • 1 ♂; Munich, Botanical Garden; 48°16′46″ N, 11°49′49″ E; elev. 516 m; 14–27 Jul. 2021; GBOL and R. Albrecht leg.; Malaise trap; BOLD GBDTA10301-21; ZSM-DIP-42307-D05 • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 12–23 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; BOLD DTIII8458-22; ZSM-DIP-42474-A03.

Distribution

Germany (new record); Sweden, European part of Russia (Gagné & Jaschhof 2021).

Porricondyla pilosoides sp. nov.
urn:lsid:zoobank.org:act:B52D8293-940B-4783-AC1C-4D5592C77F72
Fig. 26A–B

Differential diagnosis

Morphology

Porricondyla pilosoides sp. nov. differs from *P. pilosa*, a broadly similar species, as follows. The gonostylus of *P. pilosoides* is broadly rounded apically, with the entire curve occupied by a tooth consisting of countless, irregularly arranged spines (↓[1], Fig. 26A), whereas in *P. pilosa* the gonostylar apex is pointed and equipped with a comparatively small brush of spines (Jaschhof & Jaschhof 2013: fig. 102a). Also, the gonocoxal processes of *P. pilosoides* are slightly bent outwards (↓[2], Fig. 26A), while those of *P. pilosa* are slightly bent inwards (Fig. 26C). Apart from these distinctions in terminalia structures, the flagellomeral necks of *P. pilosoides* are shorter compared to those of *P. pilosa*; in the fourth flagellomere, the neck is 1.5–1.6 × the length of the node in *P. pilosoides* (Fig. 26B) versus twice the nodal length in *P. pilosa*. Larvae and females of the new species are unknown.

DNA barcode

CO1 sequences (652bp) of the type specimens are available in BIN BOLD:AEO7195. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Etymology

The specific epithet means '*pilosa*-like', an allusion to the close resemblance of the new species to *P. pilosa*.

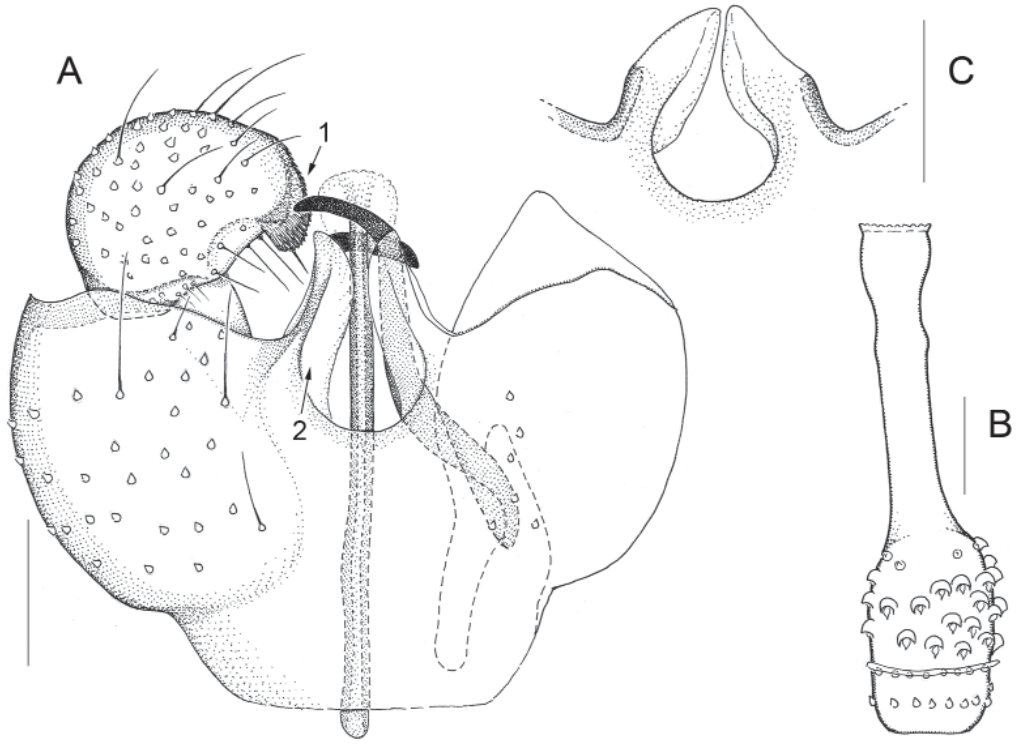

Fig. 26. A–B. *Porricondyla pilosoides* sp. nov., holotype, ♂ (ZSM-DIP-42303-G02). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. – **C**. *P. pilosa* (Mamaev & Zaitzev, 1996), ♂ (ZSM-DIP-42305-A06), gonocoxal processes, ventral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°93′87″ N, 11°18′63″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor meadow; BOLD GBDTA9954-21; ZSM-DIP-42303-G02.

Paratype

GERMANY • 1 ♂; same data as for the holotype; BOLD GBDTA9955-21; ZSM-DIP-42303-G03.

Porricondyla plana sp. nov.
urn:lsid:zoobank.org:act:DDE8219B-4B8F-455B-9BC0-300779380E73
Fig. 27

Diagnosis

Morphology

This new *Porricondyla* differs from congeneric species in the unusually large and strongly flattened gonostylus (Fig. 27A). The fairly large tooth at the gonostylar apex transitions dorsally into a finely serrate margin (↓[1], Fig. 27A). Larvae and females of *P. plana* sp. nov. are unknown.

DNA barcode

The CO1 sequence (640bp) of the paratype specimen detailed below is available in BIN BOLD:AEO7191. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

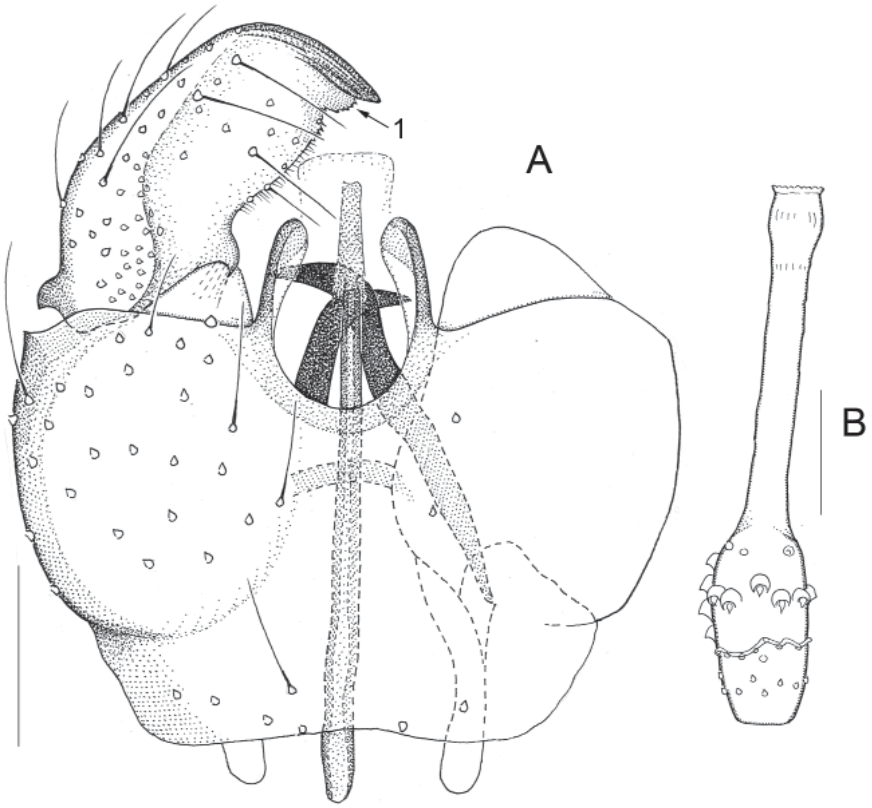

Fig. 27. *Porricondyla plana* sp. nov., holotype, ♂ (ZSM-DIP-42305-C05). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrow indicates a diagnostic character (see text).

Etymology

The Latin adjective '*plana*' means 'flat'. The name refers to the conspicuously flattened gonostylus characteristic of this species.

Type material

Holotype

GERMANY • ♂; Bavaria, Upper Franconia, Kasendorf; 50°02′76″ N, 11°31′20″ E; elev. 481 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; ZSM-DIP-42305-C06.

Paratypes

GERMANY • 1 ♂; same data as for the holotype; ZSM-DIP-42305-C01 •1 ♂; same data as for preceding; ZSM-DIP-42305-C02 • 1 ♂; same data as for preceding; BOLD GBDTA10099-21; ZSM-DIP-42305-C05.

Other characters

Male

Body length. 1.9–2.2 mm.

Head. Eye bridge dorsally 3–4 ommatidia long. Antenna slightly longer than body; scape and pedicel brighter than flagellum; circumfila present on flagellomeres 1–13; neck of fourth flagellomere 1.8 × as long as unusually slender node (Fig. 27B). Palpus 4-segmented, slightly longer than head height, apical segment longest of all.

Thorax. Scutal windows distinct. Pronotal setae 5–7, anepisternal setae 0–3, anepimeral setae 3–5.

Wing. Markedly longer than body. Length / width ratio 3.0–3.2.

Legs. Foreleg with femur 1.1 × length of tibia, T_2 not retained. Acropods, to assess structure of claws and empodia, not retained.

Terminalia (Fig. 27A). Gonocoxal synsclerite: ventral emargination U-shaped, with darkly pigmented margin; processes nearly straight, rounded apically, reinforced laterally; a narrowed portion anteriorly with only a few, mostly marginal setae; dorsal apodemes protrude beyond ventroanterior margin. Gonostylus: outside slightly convex, with numerous setae of various sizes; inside slightly concave, with much fewer setae of which 3–4 are conspicuously long and bristle-like. Parameres fairly slender, crossing each other apically, with narrow transverse bridge subbasally. Aedeagal apodeme longer than gonocoxae, moderately sclerotized, slightly broadened and with large membranous cap apically; ducts of accessory glands evident (not illustrated).

Porricondyla pumila sp. nov.

urn:lsid:zoobank.org:act:584806A4-E20A-4694-B177-DBA28ECAB9F1

Fig. 28

Diagnosis

Morphology

This unusually small species is tentatively classified in *Porricondyla* (see the remarks below). It differs from other representatives of the genus in several regressive characters: the number of flagellomeres is reduced from the ordinary 14 to 11, the eye bridge is only 0–1 ommatidium long dorsally, and vein M_4 is missing. The construction of the terminalia is absolutely *Porricondyla*-like and includes tusk-shaped parameres and large, albeit completely membranous gonocoxal processes. A peculiarity is that

the gonocoxa has a small, setose lobe near the gonostylar base (↓[1], Fig. 28A). Larvae and females of *P. pumila* sp. nov. are unknown.

DNA barcode

The CO1 sequence (640bp) of the paratype specimen detailed below is available in BIN BOLD:ADW3592. Search on BOLD's BIN Database retrieved a further two matches for this BIN, both as Cecidomyiidae sp. from Bavaria, Germany (accessed 27 Aug. 2023).

Etymology

The Latin adjective '*pumila*' means 'dwarfish'. The name refers to the unusually small size of this species.

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°94′24″ N, 11°18′33″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; nutrient-poor pasture; ZSM-DIP-42303-B01.

Paratypes

GERMANY • 1 ♂; same data as for the holotype but 47°94′30″ N, 11°18′29″ E; 9–23 Jun. 2021; GBOL and R. Albrecht leg.; Malaise trap; ZSM-DIP-42471-G04 • 1 ♂; Baden-Württemberg, Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 21–28 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA10125-21; ZSM-DIP-42305-E07.

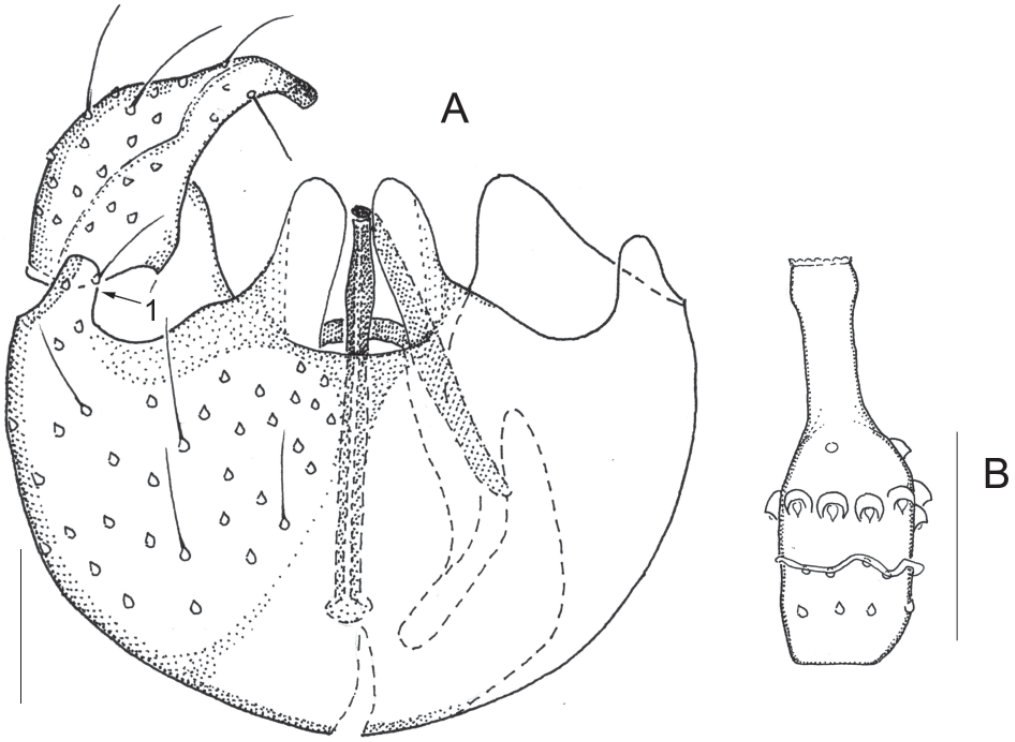

Fig. 28. *Porricondyla pumila* sp. nov., holotype, ♂ (ZSM-DIP-42303-B01). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrow indicates a diagnostic character (see text).

Other characters

Male

Body length. 1.0–1.4 mm.

Head. Antenna markedly shorter than body; scape and pedicel somewhat brighter than flagellum; slightly sinuous circumfila present on flagellomeres 1–8; neck of fourth flagellomere 0.7 × length of node (Fig. 28B). Palpus 4-segmented, as long as head height, apical segment longest of all.

Thorax. Scutal windows absent. Pronotum with 1 seta, anepisternum glabrous, anepimerum with 1–2 setae.

Wing. Markedly shorter than body. Length / width ratio 2.6.

Legs. Foreleg with femur and tibia equally long, tibia 1.3 × as long as T_2. Claws slightly bent, toothless. Empodia nearly as long as claws.

Terminalia (Fig. 28A). Gonocoxal synsclerite: ventral emargination shallow, with darkly pigmented margin; processes straight, rounded apically; a small portion ventroanteriorly devoid of setae; ventroanterior margin broadly rounded. Gonostylus: outside convex, with setae of various sizes; inside slightly concave, with fewer and finer setae, including 1 subapical bristle; apical tooth plate-like. Parameres slender, with narrow transverse bridge at about half length; apices directed posteriorly, not crossing each other. Aedeagal apodeme shorter than gonocoxae, moderately sclerotized; apex slightly bent ventrally.

Remarks

My decision to assign *P. pumila* sp. nov. to the genus *Porricondyla* rests upon three arguments: (1) the terminalia structures of males are completely *Porricondyla*-like, (2) a better classification alternative is wanting, and (3) regressive morphology per se is in my opinion not a cogent reason for defining a separate genus. On the assumption that my classification is correct, *P. pumila* is the first representative of the genus *Porricondyla* with fewer than 14 male flagellomeres, which means a significant extension of the generic definition (Jaschhof & Jaschhof 2013: 209).

Porricondyla rufescens Panelius, 1965

Morphological identification

Jaschhof & Jaschhof (2013). See the remarks below.

DNA barcode

CO1 sequences (651–654bp) of the three specimens listed below are available in BIN BOLD:AEE6538. Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Bavaria, Germany (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Upper Bavaria, Rudelzhausen; 48°57′84″ N, 11°86′26″ E; elev. 520 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10072-21; ZSM-DIP-42305-A02 • 1 ♂; Upper Franconia, Kasendorf; 50°02′76″ N, 11°31′20″ E; elev. 481 m; 13 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10094-21; ZSM-DIP-42305-B12 • 1 ♂; same data as for preceding; BOLD GBDTA10097-21; ZSM-DIP-42305-C03.

Distribution

Germany (new record); widespread in Europe, Turkmenistan, Far East of Russia (Gagné & Jaschhof 2021).

Remarks

DNA barcoding suggests that there are two presumably unnamed species close to *P. rufescens*. CO1 sequences (641–654bp) of one of these are available in BIN BOLD:ACR4876. Search on BOLD's BIN Database retrieved a further two matches for this BIN, both as Cecidomyiidae sp. from Germany and Belarus (accessed 27 Aug. 2023). This potentially new species, labeled here *Porricondyla* sp. MJDE5, also occurs in Sweden (unpublished data). The gonostylus of *P*. sp. MJDE5 is markedly more slender compared with *P. rufescens*, thus resembling that of *P. clancula* (Jaschhof & Jaschhof 2013: fig. 104b). The other potentially new species, labeled here *Porricondyla* sp. MJDE6, is represented in the present material by a single male, whose gonostylus has a peculiar shape that lies between that in *P*. sp. MJDE5 and *P. rufescens*. The CO1 sequence of that specimen is available in BIN BOLD:ACP3841. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further six matches for this BIN, all as Cecidomyiidae sp. from Germany (five matches) and Bulgaria (one).

Porricondyla tetraschistica Mamaev, 1998

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AEW6665. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 27 Jun.–12 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; BOLD DTIII8574-22; ZSM-DIP-42475-B12.

Distribution

Germany (new record); Sweden, Slovak Republic, European part of Russia (Gagné & Jaschhof 2021).

Genus ***Pseudepidosis*** Mamaev, 1966

This small genus of six Palearctic species is shown here for the first time to occur in Germany (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021b). Males of the four species known from Europe can be identified using the key in Jaschhof & Jaschhof (2013).

Pseudepidosis bifida Spungis, 1981

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AEO7125. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; BOLD GBDTA10199-21; ZSM-DIP-42306-C10.

Distribution

Germany (new record); Sweden, Latvia, Far East of Russia (Gagné & Jaschhof 2021).

Genus ***Rostellatyla*** Jaschhof, 2013

Of the two species classified in this genus, one occurs in Europe and the eastern United States, while the other is exclusively European (Gagné & Jaschhof 2021). The latter is reported here as a new addition to the German fauna.

Rostellatyla rostellata (Panelius, 1965)

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Main-Spessart, Lohr, NSG Romberg; 49°98′23″ N, 9°59′49″ E; 22 Aug.–6 Sep. 2018; D. Doczkal leg.; Malaise trap; south-facing forest edge and meadow; ZSM-DIP-42306-D11 • 1 ♂; same data as for preceding; ZSM-DIP-42306-E05 • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; 735 m elev.; 12–23 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; ZSM-DIP-42474-A05.

Distribution

Germany (new record); northern Europe, Poland, Czech Republic (Gagné & Jaschhof 2021).

Genus ***Rostratyla*** Jaschhof, 2013

This small genus of four species, previously known only from Sweden and the Baltic countries, is shown here for the first time to occur in Germany and, by extension, central Europe (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021b). Males of *Rostratyla* can be identified using the key in Jaschhof & Jaschhof (2013).

Rostratyla simplex Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Allgäu, Balderschwang, Leiterberg; 47°48′58″ N, 10°08′99″ E; elev. 1290 m; 17 May–3 Jun. 2017; D. Doczkal and J. Voith leg.; Malaise trap; ZSM-DIP-42474-C03.

Distribution

Germany (new record); Sweden, Estonia (Gagné & Jaschhof 2021).

Genus ***Schistoneurus*** Mamaev, 1964

The genus *Schistoneurus* previously contained two species, *S. irregularis* Mamaev, 1964 and *S. impressus* Mamaev, 1964, whose distribution is northern and central Europe (Gagné & Jaschhof 2021). While the presence of *S. irregularis* in Germany was recently evidenced (Jaschhof & Jaschhof 2021b), German records of *S. impressus* are still absent. Contrary to my expectations, the present project found two previously unknown species close to *S. impressus*, which are described below.

Schistoneurus paraimpressus sp. nov.
urn:lsid:zoobank.org:act:812EC0F3-671B-40BA-B0A9-39D077CCAC0D
Fig. 29

Differential diagnosis

Morphology

In terms of male morphology, *S. paraimpressus* sp. nov. bears a close resemblance to *S. impressus* (Jaschhof & Jaschhof 2013: fig. 119), the very few differences in terminalia structures being as follows. In the new species, the gonocoxal ventral emargination is markedly shallower, resembling the shape of a watch glass (↓[1], Fig. 29A); each of the parameres ends in a single small knob (↓[2], Fig. 29A) rather than in several knobs of various sizes; and the gonostylus is slightly more elongate and more slender, and has a larger area covered by thick black spines, especially along the inner margin (↓[3], Fig. 29B). Also, in *S. impressus* the gonostylar inside has a transverse ridge, which in *S. paraimpressus* is absent so that the inner surface is fairly evenly concave (↓[4], Fig. 29B). Larvae and females of the new species are unknown.

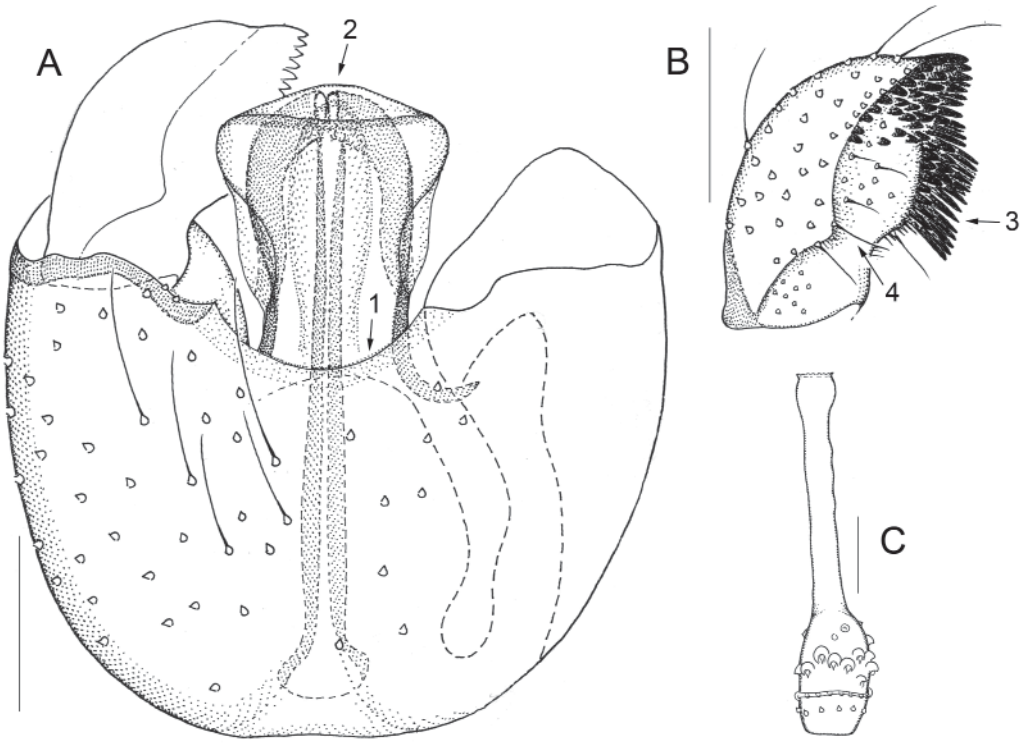

Fig. 29. *Schistoneurus paraimpressus* sp. nov., ♂♂. **A**. Holotype, terminalia, ventral view (ZSM-DIP-42303-E07). **B**. Holotype, gonostylus, ventral view. **C**. Paratype, fourth flagellomere, lateral view (ZSM-DIP-42303-E08). Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

DNA barcode

CO1 sequences (651–653bp) of the type specimens are available in BIN BOLD:AEO6710. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Etymology

The name – the Latin prefix '*para-*' means 'beside' – refers to the resemblance of this species to *S. impressus*.

Type material

Holotype

GERMANY • ♂; Bavaria, Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; BOLD GBDTA9935-21; ZSM-DIP-42303-E07.

Paratype

GERMANY • 1 ♂; same data as for the holotype; BOLD GBDTA9936-21; ZSM-DIP-42303-E08.

Schistoneurus subimpressus sp. nov.

urn:lsid:zoobank.org:act:88CE3BC6-3B59-4073-B8B6-A2A365D0AF4B

Fig. 30

Differential diagnosis

Morphology

The single male described here as *S. subimpressus* sp. nov. differs from *S. paraimpressus* sp. nov. in having shorter flagellomeral necks (the neck-to-node ratio in the fourth flagellomere is 1.5 in *S. subimpressus* (Fig. 30C) versus 2.0 in *S. paraimpressus* (Fig. 29C)) and in the construction of the gonostylus, of which the particulars are as follows. The gonostylus of *S. subimpressus* (Fig. 30B) is more compact; the thick black spines cover a markedly smaller area apically and apicomedially; the inside is less sharply separated from the outside (note the sharp longitudinal edge with black spines in *S. paraimpressus*, Fig. 29B); and the ventral protrusion bears not just ordinary setae but a small cluster of black spines. The two species might also differ in body length (1.7 mm in *S. subimpressus* versus 2.2 mm in *S. paraimpressus*), but this difference, derived from a small specimen sample, should be taken with caution considering the size variation described for *S. impressus* (1.7–2.0 mm, Jaschhof & Jaschhof 2013). Larvae and females of the new species are unknown.

DNA barcode

The CO1 sequence (653bp) of the holotype specimen is available in BIN BOLD:AEO6709. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Etymology

The name – the Latin prefix '*sub-*' means, in a broad sense, 'beside' – is an allusion to the morphological similarity of this species to *S. impressus*.

Type material

Holotype

GERMANY • ♂; Bavaria, Lower Franconia, Rimpar; 49°87′32″ N, 9°93′24″ E; elev. 272 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10171-21; ZSM-DIP-42306-A06.

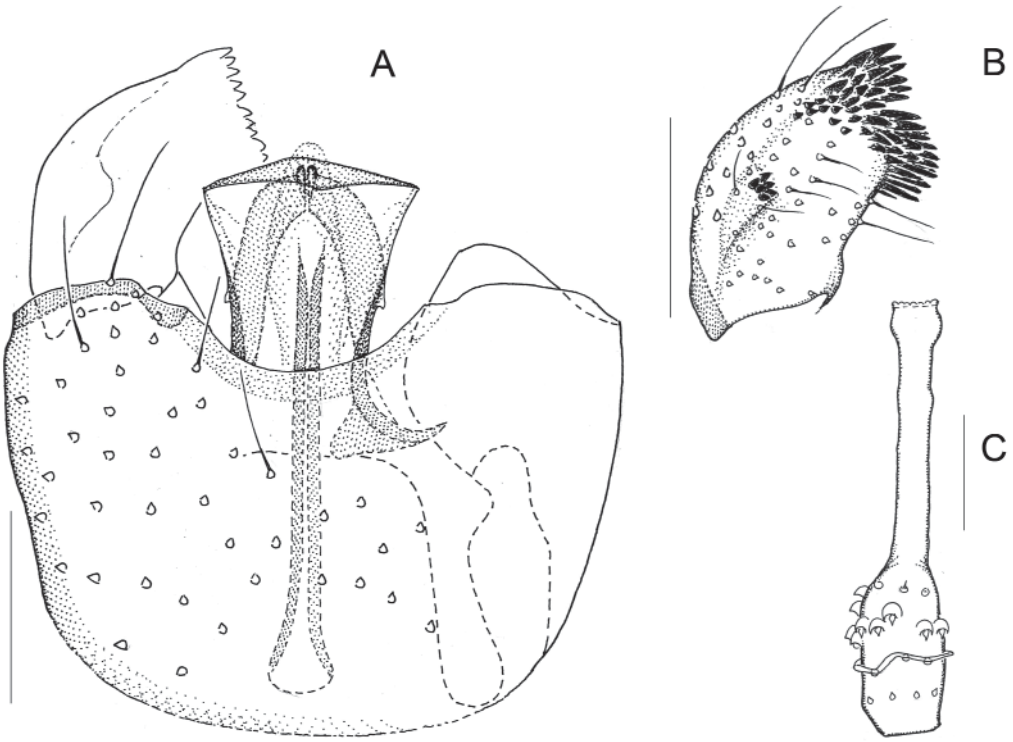

Fig. 30. *Schistoneurus subimpressus* sp. nov., holotype, ♂ (ZSM-DIP-42306-A06). **A**. Terminalia, ventral view. **B**. Gonostylus, ventral view. **C**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm.

Genus ***Serratyla*** Jaschhof, 2013

Serratyla is a small genus of four Palearctic species, all of which are found in Europe (Gagné & Jaschhof 2021). German records of this genus were previously lacking (Jaschhof & Jaschhof 2021b). The first *Serratyla* reported here from Germany is the most common and widespread species of the genus.

Serratyla pubescens (Walker, 1856)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

The CO1 sequence (652bp) of the specimen listed below is available in BIN BOLD:AEI7010. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′15″ N, 11°18′26″ E; 8 May–5 Jun. 2020; GBOL leg.; Malaise trap; fen; BOLD GBDTA9915-21; ZSM-DIP-42303-C11.

Distribution

Germany (new record); widespread in Europe, Far East of Russia (Gagné & Jaschhof 2021).

Genus ***Spungisomyia*** Mamaev & Zaitzev, 1996

Introduced as monotypic (Mamaev & Zaitzev 1996), the genus *Spungisomyia* was in recent years revealed to be fairly speciose, with eight new species described within a few years from Sweden alone (Jaschhof & Jaschhof 2013, 2020a). The description of a further new *Spungisomyia* from Sweden is pending (unpublished data). Given this speciosity in a country so close to Germany, the previous absence of records of *Spungisomyia* in Germany must be attributed to too little inventory work done there in the past (Jaschhof & Jaschhof 2021b). Consistent with this reasoning, the present project provided evidence of four different *Spungisomyia* occurring in Germany, including a new species that is described below.

Spungisomyia aberrans Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (651–652bp) of the two specimens listed below are available in BIN BOLD:AEO6592. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°94′23″ N, 11°18′30″ E; 8 May–5 Jun. 2020; GBOL leg.; Malaise trap; fen; BOLD GBDTA9907-21; ZSM-DIP-42303-C03 • 1 ♂; same data as for preceding but 47°93′88″ N, 11°18′44″ E; nutrient-poor pasture; BOLD GBDTA9946-21; ZSM-DIP-42303-F06.

Distribution

Germany (new record); Sweden, South Korea (Gagné & Jaschhof 2021).

Spungisomyia fenestrata Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (643–652bp) of the seven specimens listed below are available in BIN BOLD:ACX1735. Search on BOLD's BIN Database (accessed 27 Aug. 2023) retrieved a further three matches for this BIN, as *Spungisomyia fenestrata* from Finland (one match) and Cecidomyiidae sp. from Bavaria, Germany (two matches).

Material examined

GERMANY – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′86″ N, 11°18′62″ E; 20 Mar.–24 Apr. 2020; GBOL leg.; Malaise trap; nutrient-poor meadow; BOLD DTIII8440-22; ZSM-DIP-42473-G08 • 1 ♂; same data as for preceding; BOLD DTIII8441-22; ZSM-DIP-42473-G09 • 1 ♂; same data as for preceding; BOLD DTIII8455-22; ZSM-DIP-42473-H11 • 1 ♂; same data as for preceding but 47°93′88″ N, 11°18′44″ E; 24 Apr.–8 May 2020; nutrient-poor pasture; BOLD DTIII8456-22; ZSM-DIP-42474-A01 • 1 ♂; same data as for preceding but 47°93′83″ N, 11°18′39″ E; 21 Mar.–24 Apr. 2020; BOLD DTIII8487-22; ZSM-DIP-42474-C08 • 1 ♂; same data as for preceding but 47°94′24″ N,

11°18′33″ E; 24 Apr.–8 May 2020; BOLD DTIII8622-22; ZSM-DIP-42475-F12 • 1 ♂; same data as for preceding; BOLD DTIII8627-22; ZSM-DIP-42475-G05.

Distribution

Germany (new record); Sweden, Czech Republic (Gagné & Jaschhof 2021).

Spungisomyia germanica sp. nov.
urn:lsid:zoobank.org:act:F02F38B6-4C58-4E06-8EB4-2DC294D33C04
Fig. 31

Diagnosis

Morphology

Spungisomyia germanica sp. nov. is the only species of *Spungisomyia* known to have two small, clearly separate prescutellar windows that are in juxtaposition with each other; the usual condition in this genus is a single, large prescutellar window. As regards male terminalia characters (Fig. 31A), the compact gonostylus has a conspicuously thick base, which in ventral view is indicated by the strongly convex outer margin next to the basolateral apophysis (↓[1]); the small, U-shaped gonocoxal emargination has a broad, darkly pigmented margin (↓[2]); and the conspicuously thin parameres are multipointed apically (↓[3]). Larvae and females of the new species are unknown.

DNA barcode

CO1 sequences (651–674bp) of the type specimens are available in BIN: BOLD:AEO6595. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 27 Aug. 2023).

Etymology

The specific name, an adjective, refers to Germany as the country of provenance of the type material.

Type material

Holotype

GERMANY – **Baden-Württemberg** • ♂; Malsch, Luderbusch; 48°91′44″ N, 8°33′24″ E; elev. 112 m; 15–29 Mar. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow/aspen forest and game browsing field; BOLD GBDTA10043-21; ZSM-DIP-42304-F08.

Paratypes

GERMANY – **Baden-Württemberg** • 1 ♂; same data as the holotype; BOLD GBDTA10040-21; ZSM-DIP-42304-F05 • 1 ♂; same data as for preceding; BOLD GBDTA10042-21; ZSM-DIP-42304-F07 • 1 ♂; same data as for preceding; BOLD GBDTA10045-21; ZSM-DIP-42304-F10 • 1 ♂; same data as for preceding but 48°91′56″ N, 8°33′20″ E; elev. 110 m; 1–15 Mar. 2020; willow scrub at pond edge; BOLD GBDTA10015-21; ZSM-DIP-42304-D04 • 1 ♂; same data as for preceding; BOLD GBDTA10016-21; ZSM-DIP-42304-D05 • 1 ♂; same data as for preceding but 48°91′28″ N, 8°33′35″ E; elev. 111 m; 1–15 Mar. 2020; willow scrub and reed; BOLD DTIII8528-22; ZSM-DIP-42474-G01 • 1 ♂; same data as for preceding; BOLD DTIII8529-22; ZSM-DIP-42474-G02 • 1 ♂; same data as for preceding; BOLD DTIII8532-22; ZSM-DIP-42474-G05 • 1 ♂; same data as for preceding but 15–29 Mar. 2020; BOLD DTIII8503-22; ZSM-DIP-42474-D12 • 1 ♂; same data as for preceding; BOLD DTIII8504-22; ZSM-DIP-42474-E01 • 1 ♂; same data as for preceding; BOLD DTIII8505-22; ZSM-DIP-42474-E02 • 1 ♂; same data as for preceding; BOLD DTIII8507-22; ZSM-DIP-42474-E04 • 1 ♂; same data as for preceding; BOLD DTIII8509-22; ZSM-DIP-42474-E06 • 1 ♂; same data as for preceding; BOLD DTIII8511-22; ZSM-DIP-42474-E08 • 1 ♂; same data as for preceding; BOLD DTIII8512-22; ZSM-DIP-42474-E09 • 1 ♂; same data as for preceding; BOLD DTIII8513-22; ZSM-DIP-42474-E10 •

1 ♂; same data as for preceding; BOLD DTIII8514-22; ZSM-DIP-42474-E11 • 1 ♂; same data as for preceding; BOLD DTIII8515-22; ZSM-DIP-42474-E12 • 1 ♂; same data as for preceding; BOLD DTIII8516-22; ZSM-DIP-42474-F01 • 1 ♂; same data as for preceding; BOLD DTIII8517-22; ZSM-DIP-42474-F02 • 1 ♂; same data as for preceding; BOLD DTIII8518-22; ZSM-DIP-42474-F03 • 1 ♂; same data as for preceding; BOLD DTIII8519-22; ZSM-DIP-42474-F04 • 1 ♂; same data as for preceding; BOLD DTIII8520-22; ZSM-DIP-42474-F05 • 1 ♂; same data as for preceding; BOLD DTIII8521-22; ZSM-DIP-42474-F06 • 1 ♂; same data as for preceding; BOLD DTIII8522-22; ZSM-DIP-42474-F07 • 1 ♂; same data as for preceding; BOLD DTIII8524-22; ZSM-DIP-42474-F09 • 1 ♂; same data as for preceding; BOLD DTIII8526-22; ZSM-DIP-42474-F11. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′86″ N, 11°18′62″ E; 20 Mar.–24 Apr. 2020; GBOL leg.; Malaise trap; nutrient-poor meadow; BOLD DTIII8449-22; ZSM-DIP-42473-G10 • 1 ♂; same data as for preceding; BOLD DTIII8450-22; ZSM-DIP-42473-H05 • 1 ♂; same data as for preceding; BOLD DTIII8451-22; ZSM-DIP-42473-H06 • 1 ♂; same data as for preceding; BOLD DTIII8438-22; ZSM-DIP-42473-H07 • 1 ♂; same data as for preceding; BOLD DTIII8439-22; ZSM-DIP-42473-G06 • 1 ♂; same data as for preceding; BOLD DTIII8442-22; ZSM-DIP-42473-G07 • 1 ♂; same data as for preceding but 47°94′24″ N, 11°18′23″ E; 25 Jan.–21Mar. 2020; fen; BOLD DTIII8457-22; ZSM-DIP-42474-A02 • 1 ♂; same data as for preceding; 47°93′83″ N, 11°18′39″ E; 21 Mar.–24 Apr. 2020; nutrient-poor pasture; BOLD DTIII8488-22; ZSM-DIP-42474-C09 • 1 ♂; same data as for preceding; BOLD DTIII8494-22; ZSM-DIP-42474-D03.

Other characters

Male

Body length. 2.3–2.7 mm.

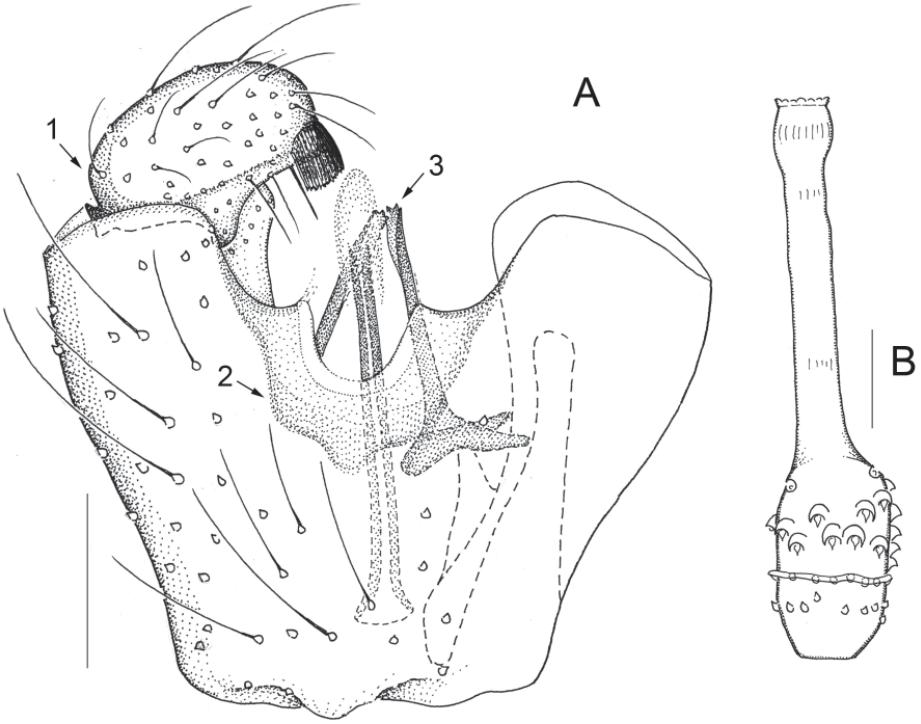

Fig. 31. *Spungisomyia germanica* sp. nov., holotype, ♂ (ZSM-DIP-42304-F08). **A**. Terminalia, ventral view. **B**. Fourth flagellomere, lateral view. Scale lines: 0.05 mm. The numbered arrows indicate diagnostic characters (see text).

Head. Eye bridge 0–1 ommatidium long dorsally. Antenna markedly longer than body; scape and pedicel concolorous with flagellum; circumfila present on all flagellomeres; neck of fourth flagellomere 1.8 × as long as node (Fig. 31B). Palpus 4-segmented, about as long as head height, apical segment longest of all.

Thorax. Presutural windows absent. Anepisternal setae 0–1.

Wing. Markedly longer than body. Length / width ratio 2.8–2.9. M_{1+2} absent.

Legs. Foreleg with femur 0.9 × length of tibia, tibia 1.3 × length of T_2. Claws with 3 teeth basally, the outermost largest. Empodia broad, as long as claws.

Terminalia (Fig. 31A). Gonocoxal synsclerite markedly narrowed towards base; narrow portion with same large setae as rest of ventral surface; anterior margin straight rather than rounded; true processes absent. Gonostylus 1.5 × as long as thick, slightly tapered towards apex, with setae of greatly varying sizes; frontal portion as strongly convex as basal portion; pectinate tooth of considerable size. Parameres for most of their lengths fairly thin, only apically slightly broader; parameral apodemes large, branched. Aedeagal apodeme shorter than gonocoxae, moderately sclerotized; apex vanishing into membranous cap; ducts of accessory glands evident (not illustrated). Membranous portion of aedeagus expansive (not illustrated).

Spungisomyia media (Spungis, 1981) agg.

Morphological identification

Jaschhof & Jaschhof (2013). Recent taxonomic inventory work in Sweden revealed *S. media* sensu Jaschhof & Jaschhof (2013) to be a complex of at least three morphospecies, inclusive of the genuine *S. media* (Jaschhof & Jaschhof 2021a). Given its wide geographic distribution, this complex is likely to be even more diversified than realized so far.

DNA barcode

The CO1 sequence (641bp) of the specimen listed below is available in BIN BOLD:AEO6594. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 28 Aug. 2023).

Material examined

GERMANY – **Bavaria** • 1 ♂; Munich, Botanical Garden; 48°16′36″ N, 11°49′67″ E; elev. 516 m; 29 Apr.–18 May 2020; GBOL and R. Albrecht leg.; Malaise trap; BOLD GBDTA10306; ZSM-DIP-42307-D10.

Distribution

Germany (new record); Sweden, Finland, Latvia, Slovak Republic, Far East of Russia, South Korea (Gagné & Jaschhof 2021).

Genus ***Unicornella*** Jaschhof & Sikora, 2020

This genus was only recently introduced for a remarkable new porricondyline found in Estonia (Sikora *et al.* 2020). The same species is shown here to occur in Germany.

Unicornella estonensis Jaschhof & Sikora, 2020

Morphological identification

Sikora *et al.* (2020).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′31″ N, 8°33′25″ E; elev. 117 m; 31 May–7 Jun. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; south-facing hill slope; ZSM-DIP-42303-G12 • 1 ♂; same data as for preceding; ZSM-DIP-42306-D02. – **Bavaria** • 1 ♂; Weilheim, Pähl, Hartschimmelhof; 47°93′99″ N, 11°18′30″ E; 20 Jun.–12 Jul. 2020; D. Doczkal and K. Grabow leg.; Malaise trap; fen; ZSM-DIP-42303-E03 • 1 ♂; same data as for preceding; ZSM-DIP-42303-E04 • 1 ♂; same data as for preceding; ZSM-DIP-42305 • 1 ♂; same data as for preceding but 47°94′30″ N, 11°18′29″ E; 9–23 Jun. 2020; nutrient-poor pasture; ZSM-DIP-42471-C03.

Distribution

Germany (new record); Estonia (Gagné & Jaschhof 2021).

Genus ***Wohllebenia*** gen. nov.
urn:lsid:zoobank.org:act:9C5AA8F0-86F2-4551-A224-F3EA9B500ED6

Type species

Wohllebenia hybrida gen. et sp. nov., described below. Monotypic.

Diagnosis

In the absence of females and larvae for study, the new genus is defined exclusively by male characters. Morphological structures previously thought to be characteristic of either Porricondylini or Dicerurini (Jaschhof & Jaschhof 2013) co-occur in *Wohllebenia* gen. nov. in a unique way, as follows. Circumfila have long posterior extension threads (Fig. 32C), a condition found typically in Dicerurini, whereas the scutum has membranous presutural windows and the parameral apodemes are short and two-branched (Fig. 32A), two conditions known from Porricondylini. The number of flagellomeres is reduced from 14, the plesiomorphous state in Porricondylinae, to 12. As regards terminalia structures, the gonocoxal ventral emargination is much larger in *Wohllebenia* (Fig. 32A) compared with other Porricondylinae (↓[1]) and both the base and the apex of the aedeagal apodeme are broadened (↓[2]).

Etymology

The generic name is to honor the German forester and book author Peter Wohlleben, born 1964, for his advocacy for ecologically and economically sustainable forestry practices.

Phylogenetic remarks

Male morphology does not provide clear indication of the tribal affiliation of *Wohllebenia* gen. nov. The decision here to classify this new genus with the Porricondylini is based on two points: in terms of morphology, porricondyline traits prevail in number; in terms of DNA barcoding, *Wohllebenia*'s position in the BOLD TaxonID Tree (Supp. file 1) is next to various porricondyline genera (*Divellepidosis*, *Porricondyla*, *Zaitzeviola*, *Holoneurus*) and at great distance from all dicerurine genera analyzed. The hybrid morphology found in *Wohllebenia* is unique among Porricondylinae known to me from the Holarctic realm, although I have seen unnamed species from elsewhere that are similar in this respect (Jaschhof & Jaschhof 2013: 110). According to the molecular phylogenetic analysis by Sikora *et al.* (2019), Dicerurini as delineated by Jaschhof & Jaschhof (2013) might be paraphyletic in relation to Porricondylini. *Wohllebenia* is a reminder that this issue requires closer attention in the future.

Wohllebenia hybrida gen. et sp. nov.
urn:lsid:zoobank.org:act:B2913DCB-D5D6-411D-B5EE-40F8A1ACAFE5
Fig. 32

Diagnosis

Morphology

This new species, the only representative of the genus *Wohllebenia*, is distinguished by the generic characters outlined above.

DNA barcode

CO1 sequences (651–652bp) of the type specimens are available in BIN BOLD:AEO7190. Search on BOLD's BIN Database retrieved no further result for this BIN (accessed 28 Aug. 2023).

Etymology

The Latin adjective '*hybrida*' means 'hybrid', an allusion to the peculiar morphology of this species.

Type material

Holotype

GERMANY • ♂; Bavaria, Lower Franconia, Rauhenebrach; 49°91′82″ N, 10°56′03″ E; elev. 366 m; 12 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10079-21; ZSM-DIP-42305-A09.

Paratype

GERMANY • 1 ♂; Baden-Württemberg, Gaggenau-Michelbach, Katzenbusch; 48°48′40″ N, 8°22′32″ E; elev. 348 m; 24 Jun.–9 Jul. 2011; D. Doczkal leg.; Malaise trap; *Quercus petraea* forest; BOLD GBDTA10006-21; ZSM-DIP-42304-C07.

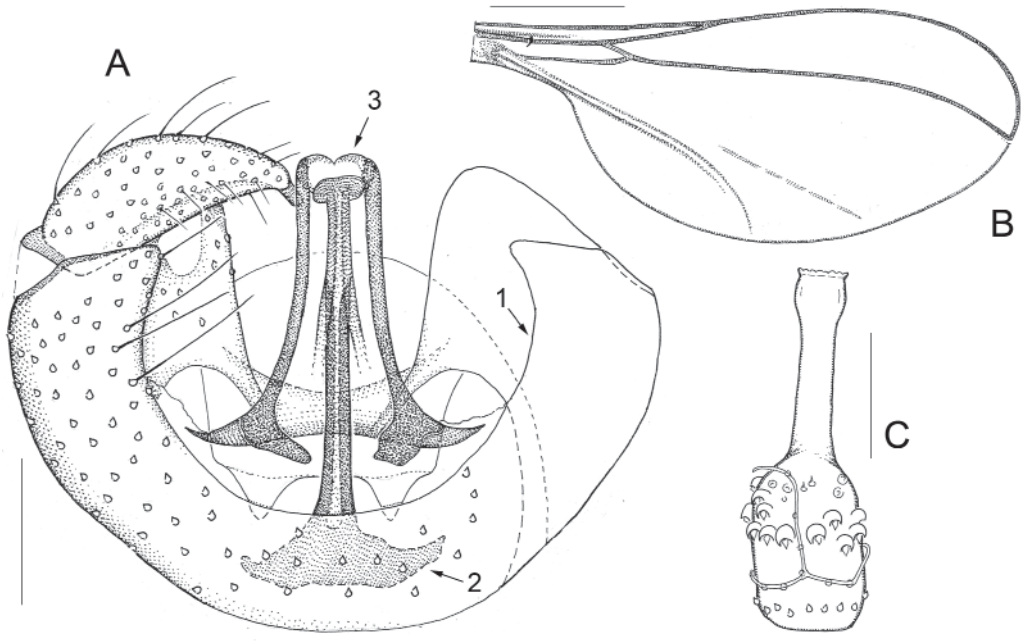

Fig. 32. *Wohllebenia hybrida* gen et sp. nov., holotype, ♂ (ZSM-DIP-42305-A09). **A**. Terminalia, ventral view. **B**. Wing, dorsal view. **C**. Fourth flagellomere, lateral view. Scale lines: A, C = 0.05 mm; B = 0.5 mm. The numbered arrows indicate diagnostic characters (see text).

Other characters

Male

Body length. 2.0–2.2 mm.

Head. Frons glabrous. Eye bridge dorsally 1–2 ommatidia long. Antenna markedly shorter than body; scape and pedicel concolorous with flagellum; circumfila including posterior extensions present on flagellomeres 1–11, partly evenly ring-shaped, partly meandering; fourth flagellomere with neck and node equally long (Fig. 32C). Palpus as long as head height, 4-segmented, apical segment longest of all.

Thorax. Scutal setae in two lateral and two dorsocentral stripes; setae-bearing stripes clearly brighter than interjacent portions. Presutural windows conspicuously bright, sharply delineated. Pronotum glabrous. Anepisternal setae 4–5. Anepimeral setae 6.

Wing (Fig. 32B). Slightly longer than body. Length / width ratio 2.3. M_{1+2} missing. M_4 short, separated from CuA, weakly pigmented, multiply interrupted, nearly straight. CuA strongly bent on apical half, nearly extending to wing margin. CuP long, reaching to bend of CuA.

Legs. Foreleg with femur and tibia equally long, tibia 1.2 × as long as T_2. Claws toothless, slightly bent on apical half. Empodia thin, as long as claws or almost so.

Abdomen. First to seventh tergites entire, somewhat tattered laterally, with large, unevenly dispersed setae; eighth tergum either unsclerotized and glabrous, or with vestigial sclerotization anterolaterally. Each of first to eighth sternites consisting of two transverse strips with large setae. Pleural membrane with a few unevenly dispersed sclerotized spots bearing setae.

Terminalia (Fig. 32A). Ninth tergum membranous and glabrous. Gonocoxal synsclerite broader than long; ventral portions broadly horseshoe-shaped, densely setose; dorsal apodemes unusually short and broad. Gonostylus 2.5 × as long as thick, thickest near midlength, tapered towards apex; apical tooth small, fingernail-shaped. Aedeagal apodeme almost as long as gonocoxae, strongly sclerotized; ducts of accessory glands unusually distinct, enter apodeme on apical third. Tegmen elongate, 3 × as long as broad, slightly narrowed towards apex, the latter strongly bent dorsad ($\downarrow^3$).

Genus ***Zaitzeviola*** Fedotova & Sidorenko, 2007

The taxonomic history of *Zaitzeviola* resembles that of *Spungisomyia* insofar as its true intrageneric diversity was discovered only several years after the genus's introduction, and then with Sweden as the main provenance of new species (Jaschhof & Jaschhof 2013). Another parallel is that *Zaitzeviola* was prior to the present study unrecorded from Germany, while the geographic neighbor, Sweden, was known to harbor seven species of the genus (Gagné & Jaschhof 2021; Jaschhof & Jaschhof 2021b). The present project found evidence of two *Zaitzeviola* occurring in Germany.

Zaitzeviola pilosistylata Jaschhof, 2013

Morphological identification

Jaschhof & Jaschhof (2013).

Material examined

GERMANY – **Bavaria** • 1 ♂; Lower Franconia, Rhön, Hausen, Eisgraben; 50°50′26″ N, 10°08′95″ E; elev. 735 m; 12–23 Jul. 2018; D. Doczkal leg.; Malaise trap; basalt rock deposit/forest edge; ZSM-DIP-42474-A06.

Distribution

Germany (new record); Sweden, Finland, Estonia (Gagné & Jaschhof 2021).

Zaitzeviola rufocinerea (Panelius, 1965)

Morphological identification

Jaschhof & Jaschhof (2013).

DNA barcode

CO1 sequences (652–653bp) of the six specimens listed below are available in BIN BOLD:ADV4998. Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further match for this BIN, as *Zaitzeviola rufocinerea* from an unknown country (mined from GenBank).

Material examined

GERMANY – **Baden-Württemberg** • 1 ♂; Malsch, Luderbusch; 48°91′44″ N, 8°33′24″ E; elev. 112 m; 10–17 May 2020; D. Doczkal and K. Grabow leg.; Malaise trap; willow/aspen forest and game browsing field; BOLD DTIII8610-22; ZSM-DIP-42475-E12 • 1 ♂; same data as for preceding but 48°91′20″ N, 8°33′26″ E; elev. 112 m; 29 Mar.–12 Apr. 2020; windthrow of willow and aspen trees; BOLD DTIII8770-22; ZSM-DIP-42477-C06 • 1 ♂; same data as for preceding but 17–24 May 2020; BOLD DTIII8714-22; ZSM-DIP-42476-F09. – **Bavaria** • 1 ♂; Lower Franconia, Rothenbuch; 49°96′34″ N, 9°38′91″ E; elev. 346 m; 15 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10092-21; ZSM-DIP-42305-B10 • 1 ♂; Lower Franconia, Kolitzheim; 49°92′01″ N, 10°19′15″ E; elev. 215 m; 16 Jul. 2019; LandKlif and J. Müller leg.; Malaise trap; BOLD GBDTA10135-21; ZSM-DIP-42305-F05 • 1 ♂; same data as for preceding; BOLD GBDTA10136-21; ZSM-DIP-42305-F06.

Distribution

Germany (new record); Sweden, Finland (Gagné & Jaschhof 2021).

Updated taxonomic checklist of Winnertziinae and Porricondylinae in Germany, including BINs assigned by BOLD Systems

Taxa new to the German fauna and BINs new to BOLD are preceded by a dot (•), first-time attributions of species names to BINs preexisting in BOLD by a circle (◦). Listed here are all the species recorded so far, i.e., included are also those that are not treated in this paper.

Winnertziinae Panelius, 1965

Diallactiini Jaschhof, 2013

Gynapteromyia Mamaev, 1965

• *Gynapteromyia brevipalpis* (Mamaev, 1964)

Gynapteromyia heteroptera (Mamaev & Spungis, 1980) [BOLD:AEO5119[26]]

Gynapteromyia longipalpis (Mamaev, 1964)

• ***Johnsonomyia*** Felt, 1908

• *Johnsonomyia szadziewskii* sp. nov. [•◦ BOLD:AEO8882, •◦ BOLD:AEM8765]

Heteropezini Schiner, 1868

Henria Wyatt, 1959

Henria schumanni Jaschhof & Jaschhof, 2021

Heteropeza Winnertz, 1846
Heteropeza pygmaea Winnertz, 1846 [BOLD:AAU6512[27], •◦ BOLD:AEP1350, ◦ BOLD:ACG3122[28]]

Leptosyna Kieffer, 1894
Leptosyna nervosa (Winnertz, 1852)

Miastor Meinert, 1864
Miastor metraloas Meinert, 1864 [◦ BOLD:ACG7101[29]]

• *Miastor* sp. MJDE1 [• BOLD:AEH9889]
Nikandria Mamaev, 1964
Nikandria brevitarsis Mamaev, 1964

Winnertziini Panelius, 1965
• ***Ekmanomyia*** Jaschhof, 2013
• *Ekmanomyia svecica* Jaschhof, 2013 [•◦ BOLD:AEP5728]

• ***Rhipidoxylomyia*** Mamaev, 1964
• *Rhipidoxylomyia bilobata* sp. nov.
• *Rhipidoxylomyia perfecta* Mamaev, 1998 [•◦ BOLD:AEO6913]

Winnertzia Rondani, 1860
• *Winnertzia acutistylus* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AER2277]
• *Winnertzia angustistylus* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AEI2068]
• *Winnertzia betulicola* Mamaev, 1963 [◦ BOLD:ACV0725]
• *Winnertzia bicolor* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AEX1156]
• *Winnertzia brevipalpata* Jaschhof, 2013 [•◦ BOLD:AER2287, ◦ BOLD:ADW4104]
• *Winnertzia bulbifera* Mamaev, 1963 agg. [◦ BOLD:ADD4410]
• *Winnertzia curvata* Panelius, 1965 [•◦ BOLD:AEI1062]
• *Winnertzia discretella* Spungis, 1992 agg.
• *Winnertzia egregia* Jaschhof & Jaschhof, 2020 [◦ BOLD:ADT2599]
• *Winnertzia ekdalensis* Jaschhof & Jaschhof, 2020
• *Winnertzia feralis* Mamaev, 2002 [◦ BOLD:ACP5877]
• *Winnertzia fraxinophila* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AER2280]
• *Winnertzia fusca* Kieffer, 1901 [◦ BOLD:ACU8967]
Winnertzia globifera Mamaev, 1963 agg. [◦ BOLD:AEI3626[30], •◦ BOLD:AEI1819]
• *Winnertzia graduata* Spungis, 1992 [BOLD:ADI3986]
• *Winnertzia hamatula* Jaschhof & Jaschhof, 2020 [◦ BOLD:ACC0207]
• *Winnertzia haushoferorum* sp. nov. [•◦ BOLD:AER2251]
• *Winnertzia imbecilla* Jaschhof & Jaschhof, 2020
• *Winnertzia incrassata* sp. nov. [•◦ BOLD:AER2284]
• *Winnertzia inornata* Jaschhof & Jaschhof, 2020 [◦ BOLD:ADW6527]
Winnertzia lugubris (Winnertz, 1853)
• *Winnertzia longiptera* Mamaev, 2002 [◦ BOLD:ACG5730]
• *Winnertzia macrodens* sp. nov. [•◦ BOLD:ADW3425]
• *Winnertzia nigra* Mamaev, 1963 [•◦ BOLD:AER2246]
• *Winnertzia nigripennis* Kieffer, 1896 [•◦ BOLD:AER2256, BOLD:ACJ3412]
• *Winnertzia padicola* Spungis, 1992 [◦ BOLD:ADM3767]
• *Winnertzia parvidens* Jaschhof & Jaschhof, 2020
• *Winnertzia parvispina* Jaschhof, 2013 [•◦ BOLD:AER2263]
• *Winnertzia pilosistylus* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AER2247]

Winnertzia pinicola Kieffer, 1913 [•◦ BOLD:AEX6614, •◦ BOLD:AEJ1471]
• *Winnertzia pratensis* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AER2264, •◦ BOLD:AER2272]
• *Winnertzia pustulatula* Jaschhof & Jaschhof, 2020 [◦ BOLD:ADX6865]
• *Winnertzia quercinophila* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AEI4017]
Winnertzia regia Mamaev, 2002 [•◦ BOLD:AER2279]
• *Winnertzia setosa* Jaschhof & Jaschhof, 2020 [•◦ BOLD:ADL8182]
• *Winnertzia silvestris* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AER2273]
• *Winnertzia smalandensis* Jaschhof & Jaschhof, 2020 [BOLD:ACN2753]
• *Winnertzia solidaginis* Felt, 1907 agg.
• *Winnertzia subdentata* sp. nov. [◦ BOLD:ACG4326]
• *Winnertzia tridens* Panelius, 1965 [◦ BOLD:ADX7219]
Winnertzia tumida Panelius, 1965 [•◦ BOLD:AEH9644]
Winnertzia tumidoides Jaschhof & Jaschhof, 2020
• *Winnertzia xylostei* Mamaev, 1963 agg. [◦ BOLD:ACC8240, •◦ BOLD:AEA0752]
• *Winnertzia* sp. MJDE2 [BOLD:ACU9822[31]]
• *Winnertzia* sp. MJDE3 [BOLD:ADL6322[32]]
• *Winnertzia* sp. MJDE4 [BOLD:ACG6177[33]]
• *Winnertzia* sp. MJDE5 [BOLD:ACR2981[34]]
• *Winnertzia* sp. MJDE6
• *Winnertzia* sp. MJDE7 [• BOLD:AER2250, BOLD:ACI8907[51], BOLD:AEU8400[52]]
• *Winnertzia* sp. MJDE8 [• BOLD:ADL7110]
• *Winnertzia* sp. MJDE9 [BOLD:ADL7110[37]]
• *Winnertzia* sp. MJDE10 [BOLD:AER2293[53]]
• *Winnertzia* sp. MJDE11 [• BOLD:AER2275, • BOLD:AEY6053, BOLD:AEI4336[54]]
• *Winnertzia* sp. MJDE12 [• BOLD:AER2270]
• *Winnertzia* sp. MJDE13 [• BOLD:AER2268]
• *Winnertzia* sp. MJDE14 [• BOLD:AER2257, BOLD:ACV3992[55]]
• *Winnertzia* sp. MJDE15 [BOLD:ACJ4725[56]]
• *Winnertzia* sp. MJDE16 [BOLD:ACF8767[44], BOLD:AEH9116[45]]
• *Winnertzia* sp. MJDE18 [BOLD:ADW9303[57]]
• *Winnertzia* sp. MJDE18A [• BOLD:AER2271]
• *Winnertzia* sp. MJDE19 [BOLD:ACG3486[46]]
• *Winnertzia* sp. MJDE19A [• BOLD:AER2285]
• *Winnertzia* sp. MJDE19B [• BOLD:AER2281]
• *Winnertzia* sp. MJDE19C [• BOLD:AER2295]
• *Winnertzia* sp. MJDE19D [BOLD:ADM4238[47]]
• *Winnertzia* sp. MJDE19E [• BOLD:AEX3196]
• *Winnertzia* sp. MJDE21
• *Winnertzia* sp. MJDE22 [• BOLD:ADU5196]
• *Winnertzia* sp. MJDE23 [• BOLD:ADS5108]
• *Winnertzia* sp. MJDE24
• *Winnertzia* sp. MJDE25 [• BOLD:AER2289]
• *Winnertzia* sp. MJDE27
• *Winnertzia* sp. MJDE28
• *Winnertzia* sp. MJDE29 [• BOLD:AER2288]
• *Winnertzia* sp. MJDE30 [• BOLD:AER2286]
• *Winnertzia* sp. MJDE31 [BOLD:ACR3885[42]]
• *Winnertzia* sp. MJDE32 [• BOLD:AER2249]
• *Winnertzia* sp. MJDE33 [•BOLD:AER2254]
• *Winnertzia* sp. MJDE34 [• BOLD:AER2259]

• *Winnertzia* sp. MJDE35 [• BOLD:AER2267]
• *Winnertzia* sp. MJDE36 [• BOLD:AER2255]
• *Winnertzia* sp. MJDE37 [BOLD:ADD4411[43]]
• *Winnertzia* sp. MJDE38 [• BOLD:AER2291]
• *Winnertzia* sp. MJDE39 [• BOLD:AER2290]
• *Winnertzia* sp. MJDE40 [• BOLD:ADT1919]
• *Winnertzia* sp. MJDE41 [• BOLD:AER2294]
• *Winnertzia* sp. MJDE42 [• BOLD:AER2266]
• *Winnertzia* sp. MJDE43 [BOLD:ACA9674[38]]
• *Winnertzia* sp. MJDE44 [BOLD:ACG8109[39]]
• *Winnertzia* sp. MJDE45 [BOLD:ADS9670[35]]
• *Winnertzia* sp. MJDE46 [BOLD:ACP8789[36]]
• *Winnertzia* sp. MJDE47 [• BOLD:AER2276]
• *Winnertzia* sp. MJDE48 [• BOLD: AEI1006, • BOLD:AER6232]
• *Winnertzia* sp. MJDE49 [BOLD:ACV1686[58]]
• *Winnertzia* sp. MJDE50 [• BOLD:AER2269, • BOLD:AER2258]
• *Winnertzia* sp. MJDE51 [• BOLD:AER2253]
• *Winnertzia* sp. MJDE52 [• BOLD:AEX6572]
• *Winnertzia* sp. MJDE53 [• BOLD:AEX3123]
• *Winnertzia* sp. MJDE54 [• BOLD:AEY5112]
• *Winnertzia* sp. MJDE55 [• BOLD:AEZ4619]
• *Winnertzia* sp. MJDE56 [BOLD:ACP8730[40]]
• *Winnertzia* sp. MJDE57 [BOLD:ACG2820[59]]
• *Winnertzia* sp. MJDE58 [• BOLD:AEX7527]
• *Winnertzia* sp. MJDE59 [BOLD:ACP6306[41]]
• *Winnertzia* sp. MJDE60 [BOLD:ADC1001[60]]
• *Winnertzia* sp. MJDE61 [BOLD:ADN9678[48]]
• *Winnertzia* sp. MJDE62 [BOLD:ACR2954[49], BOLD:AEH9430[50]]
• *Winnertzia* sp. MJDE63 [• BOLD:AER3391]
• *Winnertzia* sp. MJDE64 [BOLD:ACY6329[61]]
• *Winnertzia* sp. MJDE65 [• BOLD:AEY4394]
• *Winnertzia* sp. MJDE66 [BOLD:ADW1706[62]]

Porricondylinae Kieffer, 1913

Asynaptini Rübsaamen & Hedicke, 1926

Asynapta Loew, 1850

• *Asynapta baltica* Spungis, 1988
• *Asynapta doczkali* sp. nov. [•◦ BOLD:AER0700]
• *Asynapta falcata* sp. nov. [•◦ BOLD:AEX1610]
• *Asynapta inflatoides* Jaschhof & Jaschhof, 2019 [•◦ BOLD:AER0693]
Asynapta pectoralis Winnertz, 1853
Asynapta phragmitis (Giraud, 1863) [•◦ BOLD:AER0696]
• *Asynapta rufomaculata* Panelius, 1965 [•◦ BOLD:AER0698, •◦ BOLD:AER0697, •◦ BOLD:AER0699]
Asynapta saliciperda Felt, 1908 [◦ BOLD:ACY7620[1]]
Asynapta strobi (Kieffer, 1920) [BOLD:ACP6392[2]]
Asynapta thuraui Rübsaamen, 1893 [•◦ BOLD:AER0701]

Camptomyia Kieffer, 1894

• *Camptomyia abnormis* Mamaev, 1961 [◦ BOLD:ABW0442]
• *Camptomyia alstromi* Jaschhof & Jaschhof, 2021

• *Camptomyia calcarata* Mamaev, 1964 [•◦ BOLD:AER0305]
Camptomyia corticalis (Loew, 1851) agg. [BOLD:ADO2341[3]]
• *Camptomyia drymophila* Mamaev & Zaitzev, 1998 [•◦ BOLD:AER0308]
• *Camptomyia erythromma* (Kieffer, 1888) [•◦ BOLD:AER0307]
• *Camptomyia flavocinerea* Panelius, 1965 agg. [BOLD:ADU3419]
• *Camptomyia gigantea* Spungis, 1989
• *Camptomyia heterobia* Mamaev, 1961 [•◦ BOLD:AER0298]
• *Camptomyia multinoda* (Felt, 1908) agg. [•◦ BOLD:AEW6793, •◦ BOLD:AER0301, •◦ BOLD:AEY2389, •◦ BOLD:AEY8233, ◦ BOLD:ACU9836]
• *Camptomyia oldhammeri* Jaschhof & Jaschhof, 2019 [•◦ BOLD:AER0300]
Camptomyia rhynchostylata Jaschhof & Jaschhof, 2019
• *Camptomyia salicicola* Mamaev, 1961 [•◦ BOLD:AER0302]
• *Camptomyia serrata* Jaschhof, 2023 sp. nov.
• *Camptomyia spinifera* Mamaev, 1961 [•◦ BOLD:AER0293]
• *Camptomyia ulmicola* Mamaev, 1961
Camptomyia unisetosa Spungis, 1989 [•◦ BOLD:AER0294]
• *Camptomyia* sp. MJDE1 [• BOLD:AER0304]
• *Camptomyia* sp. MJDE2
• *Camptomyia* sp. MJDE3 [• BOLD:AER0295]
• *Camptomyia* sp. MJDE4 [• BOLD:AER0306]
• *Camptomyia* sp. MJDE5 [• BOLD:ACG:3993]
• *Camptomyia* sp. MJDE6 [• BOLD:AEZ:0229]
• *Camptomyia* sp. MJDE7 [• BOLD:AEZ5775]

Colomyia Kieffer, 1892
Colomyia caricis Rübsaamen, 1899
Colomyia clavata Kieffer, 1892
• *Colomyia caudata* Spungis, 1991

• ***Parasynapta*** Panelius, 1965
• *Parasynapta intermedia* Panelius, 1965 [•◦ BOLD:AEI5239]

Stackelbergiella Marikovskij, 1958
Stackelbergiella hordei (Barnes, 1927) [BOLD:AAN5249[4]]

• ***Svenartia*** Jaschhof, 2013
• *Svenartia spungisi* Jaschhof, 2013 [•◦ BOLD:AEZ3380]

Dicerurini Mamaev, 1966
• ***Arctepidosis*** Mamaev, 1990
• *Arctepidosis jamalensis* Mamaev, 1990

• ***Desertepidosis*** Mamaev & Soyunov, 1989
• *Desertepidosis borealis* Jaschhof, 2013 [•◦ BOLD:AER2248]

Dicerura Kieffer, 1898
Dicerura iridis (Kaltenbach, 1873) [•◦ BOLD:AEP5843]
• *Dicerura scirpicola* Kieffer, 1898 [•◦ BOLD:AEI1289]

Glemparon Jaschhof, 2013
Glemparon tomelilla Jaschhof & Jaschhof, 2018

• ***Neurepidosis*** Spungis, 1987
• *Neurepidosis conchata* Fedotova & Sidorenko, 2008 [◦ BOLD:AAV5570]
• *Neurepidosis emarginata* Jaschhof & Jaschhof, 2019 [•◦ BOLD:AEY6609]
• *Neurepidosis gracilis* Spungis, 1987 [◦ BOLD:ACP6066]
• *Neurepidosis grytsjoenensis* Jaschhof, 2013 [◦ BOLD:ACX3049]
• *Neurepidosis hartschimmelhofensis* sp. nov.
• *Neurepidosis minuta* Spungis, 1987
• *Neurepidosis simplex* sp. nov.

• ***Paratetraneuromyia*** Spungis, 1987
• *Paratetraneuromyia nobilis* (Felt, 1913)
• *Paratetraneuromyia vernalis* Spungis, 1987 [•◦ BOLD:AEI3566]

Porricondylini Kieffer, 1913
Bryocrypta Mamaev, 1964
Bryocrypta dubia Kieffer, 1896
• *Bryocrypta indubitata* Mamaev, 1964
• *Bryocrypta longissima* sp. nov. [•◦ BOLD:AER0394]

Cassidoides Mamaev, 1964
• *Cassidoides corticalis* (Mamaev, 1964) [•◦ BOLD:AEI7965]
• *Cassidoides fulviventris* (Mamaev, 1964)
Cassidoides fulvus (Kieffer, 1896)
• *Cassidoides rainensis* sp. nov. [◦ BOLD:ACY6187]
• *Cassidoides riparius* sp. nov. [•◦ BOLD:AER0232]

Cedrocrypta Kieffer, 1919
Cedrocrypta montana Kieffer, 1919

Claspettomyia Grover, 1964
• *Claspettomyia carpatica* Mamaev, 1998
• *Claspettomyia gracilostylus* sp. nov. [•◦ BOLD:AER0010]
Claspettomyia hamata (Felt, 1907) [•◦ BOLD:ADT2886]
• *Claspettomyia niveitarsis* (Zetterstedt, 1850) [•◦ BOLD:AER0011]
• *Claspettomyia parvidentata* sp. nov. [•◦ BOLD:AER0014]
Claspettomyia toelgi Kieffer, 1913 [◦ BOLD:AAN5205[8]]
• *Claspettomyia* sp. MJDE1 [BOLD:ADL7155[5]]
• *Claspettomyia* sp. MJDE2 [BOLD:AEE3721[6]]
• *Claspettomyia* sp. MJDE3 [BOLD:ACY5066][7]
• *Claspettomyia* sp. MJDE4 [• BOLD:AEE5480]
• *Claspettomyia* sp. MJDE5 [• BOLD:AER0015]

Coccopsilis Harris, 2004
• *Coccopsilis obscura* (Mamaev, 1964) [◦ BOLD:ACR1420]
Coccopsilis paneliusi (Yukawa, 1971) [BOLD:ADU6917[9], ◦ BOLD:ACI8025[10]]
• *Coccopsilis* sp. MJDE1 [BOLD:ACP0021]

• ***Cryptodontomyia*** Jaschhof, 2013
• *Cryptodontomyia elongata* Jaschhof, 2013 [•◦ BOLD:AEQ8565]
• *Cryptodontomyia nigridens* (Mamaev, 1964) [•◦ BOLD:AEQ8566]

• ***Cryptoneurus*** Mamaev, 1964
• *Cryptoneurus paludicola* Jaschhof, 2013

• ***Dallaiella*** Mamaev, 1997
• *Dallaiella petrosa* Mamaev, 1997 [•◦ BOLD:AEZ8063]

Divellepidosis Fedotova & Sidorenko, 2007
• *Divellepidosis armilla* (Mamaev, 1994) [◦ BOLD:ACC1751, •◦ BOLD:AEI9799]
• *Divellepidosis bavarica* sp. nov.
Divellepidosis fuscostriata (Panelius, 1965) [•◦ BOLD:AEP5416, ◦ BOLD:ABV9343[11]]
• *Divellepidosis hypoxantha* (Panelius, 1965) [◦ BOLD:ACR2287]
Divellepidosis pallescens (Panelius, 1965) [◦ BOLD:ACQ8578[12]]
• *Divellepidosis quadridens* (Spungis, 1981) [•◦ BOLD:AEP5411, •◦ BOLD:AEP5413]
• *Divellepidosis taigacola* Jaschhof, 2013
Divellepidosis vulgata Jaschhof, 2013 [◦ BOLD:ACG5399[13]]

• ***Holoneurus*** Kieffer, 1895
• *Holoneurus ciliatus* Kieffer, 1896 [◦ BOLD:ACE2212]

Isocolpodia Parnell, 1971
Isocolpodia graminis (Felt, 1907) [•◦ BOLD:AEO9000]
• *Isocolpodia unidentata* (Marikovskij, 1958) [•◦ BOLD:AEO9001]

• ***Lamellepidosis*** Mamaev, 1990
• *Lamellepidosis luderbuschensis* sp. nov.
• *Lamellepidosis spungisi* Mamaev, 1990

Monepidosis Mamaev, 1966
Monepidosis bulgarica Mamaev & Dimitrova, 1992 [◦ BOLD:ACF9449[14], •◦ BOLD:AER6531]
Monepidosis heterocera Jaschhof, 2016 [•◦ BOLD:AEO7956, ◦ BOLD:ACA8240[15]]
Monepidosis scanica Jaschhof, 2013
• *Monepidosis scepteri* Spungis, 2006 [◦ BOLD:ACT8511, •◦ BOLD:AEO7958]
• *Monepidosis spatulata* Spungis, 2006 [•◦ BOLD:AEI0514]

Neocolpodia Mamaev, 1964
Neocolpodia gukasiani (Mamaev, 1990) agg. [BOLD:ACY8651[16]]
• *Neocolpodia paradoxa* Mamaev, 1964

• ***Oelandyla*** Jaschhof & Jaschhof, 2020
• *Oelandyla rostrata* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AEY8257]

Paneliusia Jaschhof, 2013
• *Paneliusia albimanoides* Jaschhof, 2013 [◦ BOLD:ACP5810]
Paneliusia aurantiaca (Panelius, 1965)
Paneliusia despecta Jaschhof, 2013

Parepidosis Kieffer, 1913
Parepidosis acridula Jaschhof, 2013 [◦ BOLD:ACP2917[17]]
• *Parepidosis arcuata* Mamaev, 1964 [◦ BOLD:ADM6212]
Parepidosis argentifera (Meijere, 1906) [◦ BOLD:ACP9278[18]]
• *Parepidosis lobata* sp. nov. [•◦ BOLD:ADW4641, •◦ BOLD:AEO7433, ◦ BOLD:AEE755219]

• *Parepidosis peculiaris* Mamaev, 1966
Parepidosis planistylata Jaschhof, 2013 [◦ BOLD:AAP6827[20]]
• *Parepidosis venustior* Gagné, 2004 [•◦ BOLD:AEY3032]

• ***Parvovirga*** Jaschhof, 2013
• *Parvovirga latostylata* Jaschhof, 2013 [•◦ BOLD:AEO7393]

Paurodyla Jaschhof, 2013
Paurodyla tyresta Jaschhof, 2013

Porricondyla Rondani, 1840
• *Porricondyla acutistylata* sp. nov. [•◦ BOLD:AER2210]
• *Porricondyla clancula* Jaschhof, 2013 [◦ BOLD:ACP4789]
Porricondyla colpodioides Mamaev, 1963 agg. [BOLD:ACG3551[22]]
• *Porricondyla diversicornis* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AEO7198]
Porricondyla fulvescens Panelius, 1965 [•◦ BOLD:AEO7199]
• *Porricondyla gemina* Jaschhof & Jaschhof, 2020 [•◦ BOLD:AEY3372]
• *Porricondyla insolita* sp. nov.
• *Porricondyla lata* Mamaev, 1965
• *Porricondyla leacheana* (Walker, 1856) [•◦ BOLD:AEK9974]
• *Porricondyla macrodon* Jaschhof, 2013 [•◦ BOLD:AEK4985]
• *Porricondyla neglecta* Mamaev, 1965 [◦ BOLD:ACG3432]
Porricondyla nigripennis (Meigen, 1830) [•◦ BOLD:AEY6316, ◦ BOLD:ACP6141[23]]
• *Porricondyla oblonga* sp. nov. [◦ BOLD:ACP5893]
Porricondyla oelandica Jaschhof, 2009 [◦ BOLD:ADW0307[25]]
• *Porricondyla ornata* sp. nov.
• *Porricondyla pallidigenae* Jaschhof & Jaschhof, 2020
• *Porricondyla petrophila* Mamaev, 1986 [•◦ BOLD:ADZ9244, ◦ BOLD:ADM5312]
Porricondyla photophila Spungis, 1981
• *Porricondyla pilosa* (Mamaev & Zaitzev, 1996) [•◦ BOLD:AEO7193]
• *Porricondyla pilosoides* sp. nov. [•◦ BOLD:AEO7195]
• *Porricondyla plana* sp. nov. [•◦ BOLD:AEO7191]
• *Porricondyla pumila* sp. nov. [◦ BOLD:ADW3592]
Porricondyla roleks Jaschhof, 2013
• *Porricondyla rufescens* Panelius, 1965 [◦ BOLD:AEE6538]
• *Porricondyla tetraschistica* Mamaev, 1998 [•◦ BOLD:AEW6665]
• *Porricondyla* sp. MJDE1 [• BOLD:AEO7197]
• *Porricondyla* sp. MJDE2 [BOLD:ACY6494[21]]
• *Porricondyla* sp. MJDE3 [BOLD:ADK0678[24]]
• *Porricondyla* sp. MJDE4
• *Porricondyla* sp. MJDE5 [BOLD:ACR4876]
• *Porricondyla* sp. MJDE6 [BOLD:ACP3841]

• ***Pseudepidosis*** Mamaev, 1966
• *Pseudepidosis bifida* Spungis, 1981 [•◦ BOLD:AEO7125]

• ***Rostellatyla*** Jaschhof, 2013
• *Rostellatyla rostellata* (Panelius, 1965)

• ***Rostratyla*** Jaschhof, 2013
• *Rostratyla simplex* Jaschhof, 2013

Schistoneurus Mamaev, 1964
Schistoneurus irregularis Mamaev, 1964 [•◦ BOLD:AEI9005]
• *Schistoneurus paraimpressus* Jaschhof, 2013 [•◦ BOLD:AEO6710]
• *Schistoneurus subimpressus* sp. nov. [•◦ BOLD:AEO6709]

• ***Serratyla*** Jaschhof, 2013
• *Serratyla pubescens* (Walker, 1856) [•◦ BOLD:AEI7010]

• ***Spungisomyia*** Mamaev & Zaitzev, 1996
• *Spungisomyia aberrans* Jaschhof, 2013 [•◦ BOLD:AEO6592]
• *Spungisomyia fenestrata* Jaschhof, 2013 [BOLD:ACX1735]
• *Spungisomyia germanica* Jaschhof 2024 [•◦ BOLD:AEO6595]
• *Spungisomyia media* (Spungis, 1981) [•◦ BOLD:AEO6594]

Stomatocolpodia Mamaev, 1990
Stomatocolpodia iridis Mamaev, 1990

• ***Unicornella*** Jaschhof & Sikora, 2020
• *Unicornella estonensis* Jaschhof & Sikora, 2020

• ***Wohllebenia*** gen. nov.
• *Wohllebenia hybrida* gen. et sp. nov. [•◦ BOLD:AEO7190]

• ***Zaitzeviola*** Fedotova & Sidorenko, 2007
• *Zaitzeviola pilosistylata* Jaschhof, 2013
• *Zaitzeviola rufocinerea* (Panelius, 1965) [BOLD:ADV4998]

[1] Search on BOLD's BIN Database retrieved a further match for this BIN, as Diptera sp. from Germany (accessed 28 Aug. 2023).

[2] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Cecidomyiidae sp. and *Asynapta strobi* from Norway (accessed 28 Aug. 2023).

[3] Search on BOLD's BIN Database retrieved a further five matches for this BIN, as *Camptomyia corticalis* from Norway (accessed 28 Aug. 2023).

[4] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 176 matches for this BIN, as Diptera sp. from Germany (one match), Cecidomyiidae sp. from Canada (152), Germany (nine) and Bulgaria (ten), and *Stackelbergiella hordei* from Canada (four).

[5] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further ten matches for this BIN, as Cecidomyiidae sp. from Belarus (nine matches) and *Claspettomyia* sp. from an unknown country (mined from GenBank).

[6] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[7] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[8] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 115 matches for this BIN, as Diptera sp. from Germany (three matches) and Cecidomyiidae sp. from Costa Rica (one), United States (six), Canada (90), Germany (nine), Belarus (four), and Bulgaria (two).

[9] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further match for this BIN, as *Coccopsilis paneliusi* from an unknown country (mined from GenBank).

[10] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further nine matches for this BIN, as Diptera sp. from Germany (one match) and Cecidomyiidae sp. from Norway (four) and Germany (four).

[11] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 20 matches for this BIN, as Diptera sp. from Germany (three matches) and Cecidomyiidae sp. from Canada (four), Germany (one), and Belarus (12).

[12] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 20 matches for this BIN, as Diptera sp. from Germany (one match) and Cecidomyiidae sp. from Germany (ten) and Belarus (nine).

[13] Search on BOLD's BIN Database retrieved a further five matches for this BIN, as Diptera sp. and Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[14] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[15] Search on BOLD's BIN Database retrieved further three matches for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[16] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Diptera sp. and Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[17] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further five matches for this BIN, as Diptera sp. from Germany (one match) and Cecidomyiidae sp. from Belarus (three) and Bulgaria (one).

[18] Search on BOLD's BIN Database retrieved a further four matches for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[19] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[20] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 221 matches for this BIN, all as Cecidomyiidae sp. from Canada (215 matches), United States (three), Norway (two), and New Zealand (one).

[21] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 17 matches for this BIN, as Diptera sp. from Germany (one match) and Cecidomyiidae sp. from Germany (eight) and Belarus (eight).

[22] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 42 matches for this BIN, as Diptera sp. from Germany (five matches) and *Porricondyla colpodioides* from Germany (30 matches), Norway (four), Belarus (two), and Bulgaria (one).

[23] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further eight matches for this BIN, all as Cecidomyiidae sp. from Canada (five matches), Norway (two), and Germany (one).

[24] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further match for this BIN, as *Porricondyla nigripennis* from an unknown country (mined from GenBank).

[25] Search on BOLD's BIN Database retrieved a further four matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[26] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further match for this BIN, as *Gynapteromyia heteroptera* from an unknown country (mined from GenBank).

[27] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further 17 matches for this BIN, as *Heteropeza pygmaea* from an unknown country (mined from GenBank, two matches), *Miastor metraloas* from Australia (one), Canada (six) and Germany (one), and Cecidomyiidae sp. from Canada (seven).

[28] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further four matches for this BIN, all as Cecidomyiidae sp. from Germany (two matches), Belarus (one), and Bulgaria (one).

[29] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[30] Search on BOLD's BIN Database retrieved a further three matches for this BIN, as Cecidomyiidae sp. from Norway (accessed 28 Aug. 2023).

[31] Search on BOLD's BIN Database retrieved a further match for this BIN, as Diptera sp. from Germany (accessed 28 Aug. 2023).

[32] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Belarus (accessed 28 Aug. 2023).

[33] Search on BOLD's BIN Database retrieved a further five matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[34] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 4 May 2023).

[35] Search on BOLD's BIN Database retrieved a further four matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[36] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Norway (accessed 28 Aug. 2023).

[37] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Belarus (accessed 28 Aug. 2023).

[38] Search on BOLD's BIN Database retrieved a further seven matches for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[39] Search on BOLD's BIN Database retrieved a further five matches for this BIN, as Diptera sp. and Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[40] Search on BOLD's BIN Database retrieved a further 15 matches for this BIN, as *Winnertzia tridens* from Norway (five matches) and Germany (ten) (accessed 28 Aug. 2023).

[41] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further four matches for this BIN, all as Cecidomyiidae sp. from Canada (one match) and Norway (three).

[42] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[43] Search on BOLD's BIN Database retrieved a further match for this BIN, as *Winnertzia* sp. from Finland (accessed 28 Aug. 2023).

[44] Search on BOLD's BIN Database retrieved a further three matches for this BIN, as *Winnertzia solidaginis* from Germany (accessed 28 Aug. 2023).

[45] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Norway (accessed 28 Aug. 2023).

[46] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[47] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Cecidomyiidae sp. from Belarus (accessed 28 Aug. 2023).

[48] Search on BOLD's BIN Database retrieved a further three matches for this BIN, as Cecidomyiidae sp. and *Winnertzia* sp. from Norway (accessed 28 Aug. 2023).

[49] Search on BOLD's BIN Database retrieved a further seven matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[50] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[51] Search on BOLD's BIN Database retrieved a further four matches for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[52] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[53] Search on BOLD's BIN Database retrieved a further match for this BIN, as *Winnertzia* sp. from Norway (accessed 28 Aug. 2023).

[54] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[55] Search on BOLD's BIN Database retrieved a further two matches for this BIN, both as Cecidomyiidae sp. from Canada and Belarus (accessed 28 Aug. 2023).

[56] Search on BOLD's BIN Database retrieved a further two matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[57] Search on BOLD's BIN Database retrieved a further four matches for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[58] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Canada (accessed 28 Aug. 2023).

[59] Search on BOLD's BIN Database (accessed 28 Aug. 2023) retrieved a further five matches for this BIN, all as Cecidomyiidae sp. from Canada (one match) and Germany (four).

[60] Search on BOLD's BIN Database retrieved a further two matches for this BIN, both as Cecidomyiidae sp. from Germany and Russia (accessed 28 Aug. 2023).

[61] Search on BOLD's BIN Database retrieved a further three matches for this BIN, as Diptera sp. and Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

[62] Search on BOLD's BIN Database retrieved a further match for this BIN, as Cecidomyiidae sp. from Germany (accessed 28 Aug. 2023).

Discussion

Research over the course of two years raised the number of Winnertziinae and Porricondylinae known from Germany to 52 genera and 199 species, which is a doubling of the number of genera and a quadrupling of the number of species. Included in these numbers are one genus and 30 species that were described as new to science. Not included are 85 species, including 66 *Winnertzia*, that this project identified as potentially new, meaning for the time being it remains unclear whether those species are unnamed or just unrecognizable from published descriptions. A knowledge gain as substantial as this one could be expected from GBOL III: Dark Taxa, considering that a taxonomic inventory in Sweden directed a few years ago towards the same target groups yielded comparable results (Jaschhof & Jaschhof 2013). All indications are that the German fauna of Winnertziinae and Porricondylinae actually comprises at least three times as many species as now known, meaning the taxonomic inventory of these dipterans is still far from complete.

Given that Winnertziinae and Porricondylinae have been little surveyed south of the North and Baltic Seas, many of the first-time records reported here for Germany are new additions also to the Central European fauna. Conspicuous here is the large number of species that were previously known exclusively from Sweden, where they were described only in recent years (2013–2021). The inner-Swedish distribution as currently known of those species may follow any pattern from widespread central-northern (*Divellepidosis taigacola*), widespread central-southern (*Camptomyia alstromi*), locally restricted central (*Camptomyia oldhammeri*), to locally restricted southern (*Oelandyla rostrata*).

There is an obvious need to collect broader data that describe the European, including inner-Swedish and inner-German, range of those species more appropriately. To assess the geographic distribution is particularly challenging for rare species, such as *Dicerura scirpicola*, a porricondyline found only twice within 125 years, once in France and now in Germany.

As regards the question of which taxonomic groups are especially poorly known in Germany, or possibly contain hidden diversity to a larger extent, it is illuminating to examine the species described here as new. In Porricondylinae, 24 new species are distributed across 14 genera, with *Porricondyla* standing out with six novelties compared to only one or two in each of the other genera. A well-balanced distribution of new discoveries like this suggests that taxonomic inventories in the future should give attention to the whole of the subfamily rather than focus on certain genera only. *Porricondyla* was even prior to GBOL III: Dark Taxa known to comprise several, only partly resolved complexes of cryptic species, which explains why this notoriously speciose genus falls out of the ordinary here. A special status is indicated for *Winnertzia*, the type genus of Winnertziinae, now known to have 43 named plus 66 unnamed species in Germany. The discovery of further *Winnertzia* may be anticipated with more extensive specimen collecting, focusing on both a broader range of habitats and those parts of Germany that remained unstudied so far. The situation with *Winnertzia* of Sweden is similar (56 named and 37 unnamed species; Jaschhof & Jaschhof 2020b), although the extent of species overlap with Germany remains unvetted for the time being. No matter whether large land areas with a varied nature, such as Germany and Sweden, provide a biotope for 200 or 300 different *Winnertzia*, to cope with unexplored species diversity of such a magnitude, and unresolved taxonomic issues of such a complexity, requires a genus-specific research effort of several years.

At the generic level, it appears that the German fauna of Winnertziinae and Porricondylinae has been fairly completely recorded now, considering that only a single new genus was discovered (and described) by the present project, and only a few, mostly small genera are still missing in the German faunal list although they evidently occur in neighboring countries. Even so, as shown by the example of *Wohllebenia* gen. nov., surprising finds of true novelties cannot be ruled out at the present stage of inventory, particularly in Porricondylinae. Among mycophagous cecidomyiids, Porricondylinae are not only the most taxonomically diverse subfamily, but also remarkable for monotypic or otherwise species-poor genera in large number whose relationships are largely obscure.

The integrative taxonomic approach exerted here may be regarded as effective for taking an inventory of the winnertzines and porricondylines of a particular geographic area. Although new methods in support of the discovery process are being developed all the time and proven useful in practice, GBOL III: Dark Taxa has once more shown for cecidomyiids that taxonomic inventories are costly in terms of labor and time, if the final goal is Linnean species rather than molecular operational taxonomic units (for earlier discussions of this aspect, see Jaschhof & Jaschhof 2021a, 2021b). Taxonomic expertise, indispensable for resolving the complex issues inherent in hyperdiverse taxa, will be very difficult to automate. On top of this, compiling a taxonomic checklist leaves relevant aspects of a biological species aside, such as the life history, ecological needs, interactions with other species, evolutionary history, and many more. In other words, we are still a world away from an understanding of the ecosystemic role of each of the species treated in the present paper. To explore this species by species, a task we have not even begun, would keep generations of naturalists busy. Awareness of this circumstance should not yield to capitulation to the gigantic task ahead of us.

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Supplementary material

Supp. file 1. Neighbor-joining tree of CO1 barcode sequences based on K2P distances.
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